

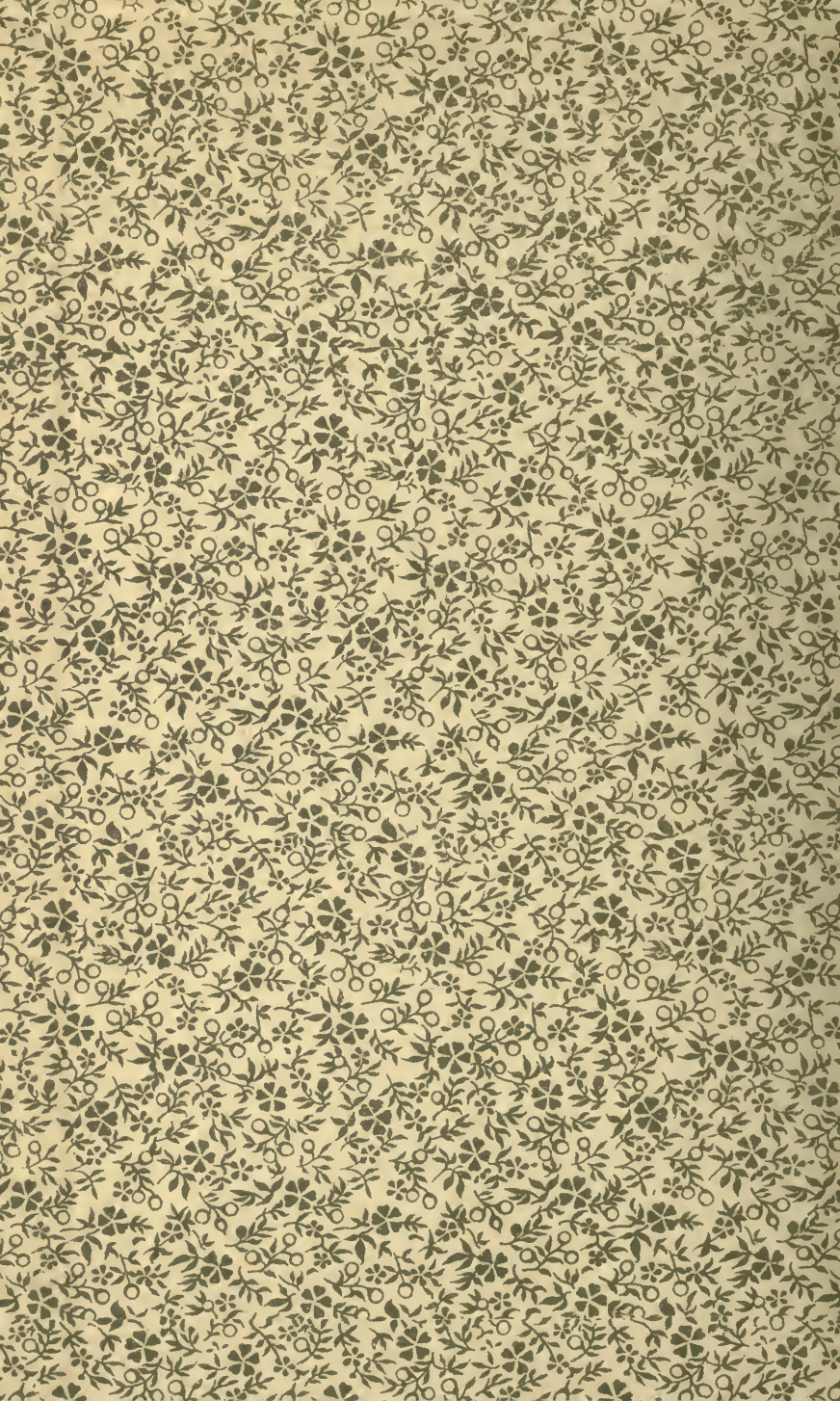
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THE
IRONWORKS
OF THE
UNITED STATES.

A DIRECTORY

OF THE
FURNACES, ROLLING MILLS, STEEL WORKS, FORGES
AND BLOOMARIES IN EVERY STATE.

PREPARED BY
THE AMERICAN IRON AND STEEL ASSOCIATION.

No. 265 SOUTH FOURTH STREET, PHILADELPHIA.

CENTENNIAL EDITION.

PHILADELPHIA:

1876.

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P R E F A C E .

We take pleasure in presenting to the American Iron Trade a revised edition of our Directory of "The Ironworks of the United States," the first edition of which appeared in 1874. That edition was as complete and perfect as it was possible to make it; but with the lapse of time, and especially with the changes produced by the continued prostration of business, many of the statements contained in it have been found to require modification, while new enterprises have pressed for recognition. The new edition therefore became a necessity. The work upon it, however, has not been grudgingly bestowed, but has been a labor of love to all engaged in it. The iron and steel manufacturers of the country have as a rule cordially given us all the information that was requested of them, and we have taken pains to systematize and present in acceptable form the information received. The utmost care has been taken to avoid errors, and especially to guard against omissions. The book has been carefully printed.

The corrections, alterations and additions in the Directory have been brought down to the 1st of January, 1876. The work is therefore not without interest and value as a record of the extent of the Iron Trade of the United States in the Centennial year of the Republic, and of the companies and individuals who were then engaged in it. Other information than that contained in the Directory, appropriate to the Centennial Celebration, will appear later in the year. It will be chiefly statistical and historical. The volume containing it will form a fitting companion to that which is herewith presented.

The plan of the Directory is simple, and yet is believed to be sufficiently comprehensive to meet all reasonable expectations. Useless elaboration of details has been avoided, and all extraneous matter has been excluded. Brevity, clearness, accuracy, and fullness have been kept constantly in view. All information is classified; first, by divisions representing the different branches of the trade; second, by States; third, by districts; fourth, alphabetically. An index, with such an arrangement, would be superfluous, and none is given. A Table of Contents will furnish all needed assistance to the reader in enabling

him to refer to any particular establishment and its connections, if it should have any.

Two tabulated pages immediately following this preface will give to the reader a bird's eye view of the contents of the Directory, but we have thought it best to condense even this summary, as follows:

Whole number of completed Blast Furnaces, Jan. 1, 1876,	713
Annual capacity of all the Furnaces, in net tons,	5,439,230
Whole number of Rolling Mills, Jan. 1, 1876,	332
Whole number of Single Puddling Furnaces, (each double furnace counting as two single ones,)	4,475
Total annual capacity of all Rolling Mills in finished iron, net tons,	4,189,760
Annual capacity of all the Rail Mills in heavy rails, net tons, .	1,940,300
Number of Bessemer Steel Works, Jan. 1, 1876,	11
Annual capacity in ingots, net tons,	500,000
Number of Bessemer Converters,	24
Number of Open-Hearth Steel Works, Jan. 1, 1876,	16
Number of Open-Hearth Furnaces,	22
Annual capacity in ingots, net tons,	45,000
Number of Crucible and other Steel Works, Jan. 1, 1876, . . .	39
Annual capacity of Merchantable Steel, net tons,	108,250
Of which there are of Crucible Steel, in net tons,	45,000
Number of Catalan Forges, making blooms direct from the ore, Jan. 1, 1876,	39
Annual capacity in blooms and billets, net tons,	59,450
Number of Bloomaries, Jan. 1, 1876, making blooms from pig iron,	59
Annual capacity in blooms, net tons,	60,200

We have omitted from this edition of the Directory all mention of "projected" iron and steel enterprises of the probable completion of which we were unable to obtain satisfactory evidence.

In the preparation of the Directory, our assistant, Mr. GEORGE W. COPE, has rendered invaluable service, and we take pleasure in recognizing the industry and good judgment he has displayed in promoting a most difficult undertaking.

JAMES M. SWANK,

PHILADELPHIA, February 22, 1876.

Secretary.

TABULATED STATEMENT

OF THE NUMBER AND CAPACITY OF THE FURNACES AND ROLLING MILLS IN THE UNITED STATES.

STATES.	FURNACES.				ROLLING MILLS.			
	Districts.		Totals.		Number of Mills.	Whole number of Single Pudding Furnaces.	Total Annual Rolling Capacity, including Rails, in net tons.	Annual Rolling Capacity of Heavy Rail Mills, in net tons.
	No. of Com-pleted Stacks.	Annual Ca-pacity in net tons.	No. of Com-pleted Stacks.	Annual Ca-pacity in net tons.				
Maine.....	.....	.....	1	5,700	2	26	25,000	15,000
New Hampshire.....	.....	.....	.....	.....	1	.....	6,000	.....
Vermont.....	.....	.....	2	7,000	1	14	20,000	20,000
Massachusetts.....	.....	.....	6	25,250	22	173	179,100	40,000
Rhode Island.....	.....	.....	.....	.....	2	12	17,200	.....
Connecticut.....	.....	.....	10	35,000	1	14	22,900	.....
New York.....	.....	.....	57	529,500	23	309	360,400	169,000
New Jersey.....	.....	.....	18	183,600	16	172	141,300	15,000
Pennsylvania—	.....	.....	.....	.....	.....	.....	.....	.....
Lehigh Valley.....	50	553,600	.....	.....	.....	.....	.....	.....
Schuylkill Valley.....	50	401,000	.....	.....	.....	.....	.....	.....
Upper Susquehanna Valley..	26	217,000	.....	.....	.....	.....	.....	.....
Lower Susquehanna Valley..	36	234,300	.....	.....	.....	.....	.....	.....
Shenango Valley.....	32	316,000	.....	.....	.....	.....	.....	.....
Allegheny County.....	11	237,000	.....	.....	.....	.....	.....	.....
Miscellaneous Bituminous...	35	228,000	.....	.....	.....	.....	.....	.....
Charcoal.....	39	78,000	.....	.....	.....	.....	.....	.....
Total Pennsylvania.....	.....	.....	279	2,264,900	137	2,153	1,624,500	684,500
Delaware.....	.....	.....	.....	.....	8	34	30,000	.....
Maryland.....	.....	.....	24	95,700	5	99	91,500	58,000
Virginia.....	.....	.....	34	72,400	4	46	48,460	.....
North Carolina.....	.....	.....	8	17,500	.....	.....	.....	.....
Georgia.....	.....	.....	12	48,400	2	13	23,500	15,000
Alabama.....	.....	.....	14	83,000	1	4	1,000	.....
Texas.....	.....	.....	1	1,500	.....	.....	.....	.....
West Virginia.....	.....	.....	12	99,400	8	181	114,500	25,000
Kentucky—	.....	.....	.....	.....	.....	.....	.....	.....
Hanging Rock.....	13	74,500	.....	.....	.....	.....	.....	.....
Western Region.....	10	63,800	.....	.....	.....	.....	.....	.....
Total Kentucky.....	.....	.....	23	138,300	10	160	104,000	15,000
Tennessee.....	.....	.....	22	99,400	4	31	41,400	28,000
Ohio—	.....	.....	.....	.....	.....	.....	.....	.....
Hanging Rock.....	49	267,320	.....	.....	.....	.....	.....	.....
Mahoning Valley.....	22	280,000	.....	.....	.....	.....	.....	.....
Miscellaneous.....	28	316,000	.....	.....	.....	.....	.....	.....
Total Ohio.....	.....	.....	99	863,320	46	669	634,600	292,000
Indiana.....	.....	.....	9	71,500	*10	129	100,600	71,000
Illinois.....	.....	.....	12	188,000	9	98	323,000	305,000
Michigan.....	.....	.....	34	268,160	3	31	32,000	18,000
Wisconsin.....	.....	.....	14	109,700	1	34	69,800	44,800
Minnesota.....	.....	.....	1	5,000	.....	.....	.....	.....
Missouri.....	.....	.....	19	223,500	6	68	94,000	50,000
Kansas.....	.....	.....	.....	.....	2	.....	45,000	45,000
Wyoming Territory.....	.....	.....	.....	.....	1	.....	15,000	15,000
Utah Territory.....	.....	.....	1	1,500	.....	.....	.....	.....
California.....	.....	.....	.....	.....	1	5	25,000	15,000
Oregon.....	.....	.....	1	4,000	.....	.....	.....	.....
Total.....	.....	.....	713	5,439,230	332	4,475	4,189,760	1,940,300

*See the last page of the book for description of a mill in Indiana, which was not received in time to appear in its proper place.

TABULATED STATEMENT

OF THE NUMBER AND CAPACITY OF THE STEEL WORKS, CATALAN FORGES, AND BLOOMARIES IN THE UNITED STATES.

STATES.	BESSEMER STEEL.		OPEN- HEARTH STEEL.		CRUCIBLE AND OTHER STEEL.*		CATALAN FORGES.†		BLOOM- ARIES.‡	
	Number of Works.	Annual Capacity. Net tons of ingots.	Number of Works.	Annual Capacity. Net tons.	Number of Works.	Annual Capacity. Net tons.	Number of Works.	Annual Capacity. Net tons.	Number of Works.	Annual Capacity. Net tons.
New Hampshire.....	.....	500,000	1	45,000	.....	.....	.....	.....	.....	.....
Vermont .....	.....		.....		.....	.....	2	2,000	.....	.....
Massachusetts.....	.....		3		.....	.....	.....	.....	1	500
Rhode Island.....	.....		1		.....	.....	.....	.....	.....	.....
Connecticut.....	.....		.....		2	1,950	.....	.....	.....	.....
New York.....	1		.....		3	3,300	27	55,000	.....	.....
New Jersey.....	.....		1		7	13,300	1	1,200	4	2,300
Pennsylvania.....	5		6		20	85,000	.....	.....	39	42,000
Maryland.....	.....		.....		1	800	.....	.....	1	3,000
Virginia.....	.....		.....		.....	.....	.....	.....	7	5,300
North Carolina.....	.....		.....		.....	.....	7	1,000	2	500
West Virginia .....	.....		.....		.....	.....	.....	.....	1	900
Kentucky .....	.....		.....		1	500	.....	.....	.....	.....
Tennessee.....	.....		.....		.....	.....	2	250	1	1,000
Ohio	1		3		4	3,100	.....	.....	.....	.....
Illinois.....	3		1		1	300	.....	.....	.....	.....
Missouri.....	1		.....		.....	.....	.....	.....	3	4,700
Total.....	11	500,000	16	45,000	39	108,250	39	59,450	59	60,200

* The steel works of the country have an annual capacity of 45,000 *net* tons of crucible steel, but our returns do not enable us to indicate correctly the States which are capable of producing this description. The "other" steel embraced under this head is known as German, blister, and puddled steel.

† Make blooms direct from the ore.

‡ Make blooms from pig iron or scrap iron.

§ The Bessemer steel works have 24 converters, and the number of open-hearth furnaces in the country is 22.

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THE IRONWORKS OF THE UNITED STATES.

BLAST FURNACES.

MAINE.

Katahdin Iron Works, O. W. Davis, Jr., Bangor. Furnace at Katahdin Iron Works, in Piscataquis county. Charcoal. One stack, 38 x 9, built in 1846 and rebuilt in 1874; hot blast; water-power; annual capacity, 5,700 net tons. This furnace is supplied with limonite ore obtained about a mile from the Works; its quality is very fine, yielding from 55 to 60 per cent.

Number of furnaces in Maine: 1 charcoal stack.

VERMONT.

CHARCOAL.

Pittsford Furnace, J. Prichard, Pittsford, Rutland county. One stack, 40 x 10; hot blast; water-power; built in 1844; formerly Vermont Iron Co.; annual capacity, 4,000 net tons. Product, car-wheel and other foundry iron, and Vermont spiegel.

Shaftsbury Iron Works, Geo. W. Swett & Co., lessees, South Shaftsbury, Bennington county. One stack, 30 x 9½, built in 1863; cold blast; water-power; annual capacity, 3,000 net tons.

Number of furnaces in Vermont: 2 charcoal stacks.

MASSACHUSETTS.

ANTHRACITE.

Pomeroy Iron Works, West Stockbridge, Berkshire county. One stack, 50 x 14, built in 1850; burned and rebuilt in 1872; annual capacity, 10,250 net tons. Gen. W. F. Bartlett, Supt. and Treasurer, and Wm. M. Kniffin, Resident Agent.

CHARCOAL.

Cheshire Furnace, Richmond Iron Works, West Stockbridge, Berkshire county. One stack, 36 x 9, built in 1850. George Church, Treasurer. *See Richmond and Van Deusenville Furnaces.*

Lanesboro' Furnace, Lanesboro' Iron Co., Lanesboro', Berkshire county. One stack, 42 x 11, built in 1847.

Lenox Iron Works, Taylor, Church & Coffing, Lenox Furnace, Berkshire county. One stack, 32 x 9, rebuilt in 1837; warm blast; water-power.

Richmond Furnace, Richmond Iron Works, West Stockbridge, Berkshire county. One elliptical stack, 32 x 11½ and 8½, built in 1829. *See Cheshire Furnace.*

Van Deusenville Furnace, Richmond Iron Works, Great Barrington, Berkshire county. One stack, 32 x 9, built in 1834; water-power. *See Cheshire Furnace.*

Number of furnaces in Massachusetts: 6 stacks; 1 anthracite and 5 charcoal stacks.

CONNECTICUT.

CHARCOAL.

Canaan Furnaces, Barnum Richardson Company, Lime Rock, Litchfield county. Three stacks, each 32 x 9, one built in 1840, one in 1847, and the last in 1872; hot blast; water-power; total annual capacity, 12,500 net tons. Wm. H. Barnum, President.

Chapinville Furnace, Landen & Co., Chapinville, Litchfield county. One stack, 32 x 9, built in 1825; hot blast; water-power; open top; annual capacity, 3,000 net tons. Horace Landen, Manager.

Cornwall Bridge Iron Co., Cornwall Bridge, Litchfield county. One stack, 32 x 9, built in 1833; hot blast; water-power. Wm. H. Barnum, President, Lime Rock.

Hunts Lyman Iron Co., Huntsville, Litchfield county. One stack, 32 x 9, built in 1847; hot blast; water-power; open top; annual capacity, 3,500 net tons. Moses Lyman, President; Saml. W. Bradley, Secretary, and Wm. H. Barnum, Treasurer, Lime Rock.

Kent Iron Co., Kent, Litchfield county. One stack, 31 x 9, built in 1849; warm blast; water-power; closed top; annual capacity, 4,000 net tons. Burrett Eaton, President; Jno. Hopson, Jr., Secretary, and John Hopson, Treasurer and Manager.

Lime Rock Iron Co., Lime Rock, Litchfield county. One stack, 32 x 9, built in 1864; warm blast; water-power; annual capacity, 2,500 net tons. Wm. H. Barnum, President.

Sharon Valley Iron Co., Sharon Valley, Litchfield county. One stack, 31 x 9½; very old; rebuilt in 1863; hot blast; water-power. Wm. H. Barnum, President, Lime Rock.

Shepang Iron Co., R. E. Day, President, Hartford. Furnace at Roxbury, Litchfield county. One stack, 40 x 9, built in 1866; hot blast. Not in blast since 1872.

Number of furnaces in Connecticut: 10 charcoal stacks.

NEW YORK.

ANTHRACITE.

- Burden Iron Works, H. Burden & Sons, Troy, Rensselaer county. Two stacks, each 60 x 16, built in 1866 and 1868; closed tops; total annual capacity, 28,000 net tons. *See Rolling Mills.*
- Cedar Point Iron Works, Cedar Point Iron Co., Port Henry, Essex county. One stack, 70 x 16, built in 1872-3, first put in blast in August, 1875; blast heated by four 22-foot Whitwell stoves; bell-and-hopper top; annual capacity, 16,000 net tons of Bessemer pig iron. Silas H. Witherbee, President; George R. Sherman, Vice-President; Hosea B. Willard, Secretary and Treasurer, and Thomas F. Witherbee, Manager.
- Charlotte Furnace, Rochester Iron Manufacturing Co., Rochester, Monroe county. One stack, 50 x 14, situated 6 miles from Rochester at the mouth of the Genesee River.
- Clinton Furnace, Clinton Iron Co., Kirkland, Oneida county. One stack, 48 x 13; water-power; built in 1873; annual capacity, 6,000 net tons.
- Clove Furnace, Peter P. Parrott, Greenwood Iron Works, Orange county. One stack, 55 x 16, built in 1854. *See Greenwood (charcoal) Furnace.*
- Cold Spring Furnace, Cold Spring Iron Co., lessees, Cold Spring, Putnam county. One stack, 60 x 15½, built in 1863. Formerly Phillips Iron Works.
- Columbia Furnace, Albany and Rensselaer Iron and Steel Co., Troy. Furnace at Hudson, Columbia county. One stack, 40 x 14, built about 1860; annual capacity, 10,000 net tons. *See Rolling Mills.*
- Crown Point Furnaces, Crown Point Iron Co., Crown Point, Essex county. Two stacks, each 60 x 16, built in 1873. J. T. Hammond, President, and G. Jammie, Superintendent.
- Elmira Iron and Steel Rolling Mill Co., Elmira, Chemung county. Two stacks, each 56 x 16, built in 1872; one put in blast Oct. 5, 1872; total annual capacity, 30,000 net tons. *See Rolling Mills.*
- Fallkill Iron Co., A. Tower, Agent, Poughkeepsie, Dutchess county. Two stacks, each 60 x 16, built in 1860; total annual capacity, 25,000 net tons.
- Fletcher Furnace, Pratt & Co., Buffalo, Erie county. One stack, 60 x 16; closed top; fuel, anthracite coal and coke. *See Rolling Mills.*
- Fort Edward Furnace, Albany and Rensselaer Iron and Steel Co., Troy. Furnace at Fort Edward, Washington county. One stack, 50 x 15, built in 1853; water-power; annual capacity, 11,000 net tons. *See Rolling Mills.*
- Franklin Iron Works, Franklin Iron Works P. O., Oneida county. Two stacks, Franklin and De Wolf, each 54 x 14, built in 1870 and 1871; closed tops; total annual capacity, 20,000 net tons. O. B. Matteson, President; E. B. Armstrong, Vice-President; C. H. Smyth, Secretary and Superintendent, and Delos De Wolf, Treasurer.

- Hudson Furnaces, Hudson Iron Co., Hudson, Columbia county. Two stacks, each 49 x 15½, built in 1851; closed tops; total annual capacity, 22,000 net tons. J. W. Hoysradt, President and General Agent, and S. Seymour, Secretary.
- Ithaca Iron Co., Ithaca, Tompkins county. Building one stack, 65 x 16.
- Jagger Iron Works, Jagger Iron Co., Albany. Two stacks, each 60 x 16, built in 1871; total annual capacity, 25,000 net tons. Formerly Corning Iron Works.
- Manhattan Iron Works, Manhattan Iron Co., Manhattanville, New York City. Two stacks, 49 x 12 and 49 x 13, built in 1851 and 1857; total annual capacity, 14,000 net tons. B. W. Van Voorhis, Treasurer.
- Napanoch Furnace, Ulster Blast Furnace Co., Napanoch, Ulster county. One stack, 46 x 12, put in blast in July, 1873, after a long rest; annual capacity, 6,000 net tons. Now idle and offered for sale by H. Bange, 94 Gold st., New York.
- Niagara River Iron Co., Buffalo. Furnace at Ironton, Erie county. One stack, 60 x 16, built in 1873, and put in blast Nov. 7, 1873; annual capacity, 12,000 net tons.
- Olcott Iron Manufacturing Co., Albany. Agents, Crocker Brothers, 32 Cliff st., New York. Two stacks, each 60 x 16, built in 1873-4; total annual capacity, 28,000 net tons. Abm. Van Vechten, President; Albion Ransom, Vice-President, and Wm. R. Hills, Secretary and Treasurer.
- Onondaga Iron Co., Geddes, Onondaga county. Two stacks, each 65 x 15; total annual capacity, 25,000 net tons. Wm. H. H. Gere, Treasurer.
- Ontario Furnace, Ontario Iron Co., Rochester. Furnace at Furnaceville, Wayne county. One stack, 50 x 11, first put in operation in October, 1870; open top; annual capacity, 6,000 net tons. James Brackett, President and Manager; Isaac Palmer, Vice-President; W. H. Averell, Secretary, and J. S. Averell, Treasurer.
- Peekskill Furnace, Peekskill Iron Co., Peekskill, Westchester county. One stack, 61 x 16, built in 1853, and rebuilt in 1874; bell-and-hopper top; total annual capacity, 12,000 net tons. Thomas F. Wright, President; Frank F. Fowler, Vice-President, and Hugh W. Adams, Secretary and Treasurer.
- Port Henry Furnaces, Bay State Iron Co., W. T. Foote, Agent, Port Henry, Essex county. General office, 2 Pemberton Square, Boston. Two stacks, each 66 x 16, built in 1853 and 1861; rebuilt in 1871 and 1868, respectively; total annual capacity, 28,000 net tons. *See Massachusetts Rolling Mills.*
- Poughkeepsie Iron Co., A. Tower, Agent, Poughkeepsie. Two stacks, 43 x 14 and 48 x 15, built in 1848 and 1854 respectively; total annual capacity, 20,000 net tons.

Sterling Iron and Railway Co., 42 Pine st., P. O. Box 1,384, New York City. Furnaces in Orange county. Two stacks, Sterling, 42 x 13, built in 1848, and Southfield, 45 x 12, built in 1806. A. W. Humphreys, Treasurer.

Union Iron Works, Union Iron Co., Buffalo, Erie county. Three stacks, Pioneer, Excelsior, and Monitor, built in 1861, 1862, and 1864; dimensions, respectively, 50 x 17, 50 x 15, and 50 x 14; all have closed tops; total annual capacity, 44,000 net tons. *See Rolling Mills.*

Number of anthracite furnaces: 41 completed stacks, and 1 building.

CHARCOAL.

Alpine Furnace, Northern New York Iron and Mining Co., Lott Frost, Manager, Antwerp, Jefferson county. One stack, 32 x 9; hot blast; water-power; built from 1845 to 1850.

Beckley Iron Works, George Adams, Chatham Village, Columbia county. One stack, 32 x 9; hot blast; built in 1873; put in blast in July, 1873; annual capacity, 3,500 net tons.

Carthage Furnace, Carthage Iron Co., Carthage, Jefferson county. One stack, 36 x 9, built in 1818 and rebuilt in 1872; warm blast; open top; water-power; annual capacity, 3,500 net tons. R. N. Gere, President; L. H. Mills, Vice-President, and C. F. Bissell, Secretary and Manager.

Clove Spring Iron Works, Sylvan Lake, Dutchess county. Agents, Crocker Brothers, 32 Cliff st., New York. Two stacks, 32 x 9, and 35 x 9½, built in 1830 and 1873, respectively; warm blast; steam and water power; combined annual capacity, 7,000 net tons. One stack in blast in 1875.

Copake Iron Works, Frederick Miles, Copake Iron Works, Columbia county. One stack, 32 x 9; warm blast; steam and water power; built in 1872; annual capacity, 4,400 net tons. An old stack, built in 1845, has recently been torn down.

Fletcherville Furnace, Witherbees & Fletcher, Mineville, Essex county. One stack, 61½ x 11; hot blast; built in 1863-4; annual capacity, 4,500 net tons.

Greenwood Furnace, Peter P. Parrott, Greenwood Iron Works, Orange county. One stack, 42 x 9; warm blast; water-power; built in 1813; not in blast since September, 1871. Only charcoal furnace in Southern New York or Northern New Jersey. *See Clove (anthracite) Furnace.*

Millerton Iron Co., Irondale, Dutchess county. One stack, 32 x 9½; very old; repaired in 1864; hot blast; annual capacity, 4,000 net tons. W. H. Barnum, President; Walter Phelps, Secretary and Treasurer.

Norwich Furnace, J. & N. C. Scoville, Buffalo. Furnace at Norwich, Chenango county. One stack, 32 x 9; very old; repaired in 1873; hot blast; annual capacity, 4,000 net tons.

- Phoenix Furnace, C. S. Maltby, Millerton, Dutchess county. One stack, 32 x 9½, built in 1840; hot blast; annual capacity, 3,500 net tons.
- Port Leyden Furnaces, Black River Iron and Mining Co., Port Leyden, Lewis county. Two stacks, 40 x 9 and 32 x 9, built in 1864; hot blast; water-power; open tops; total annual capacity, 7,000 net tons. Not in blast since Oct. 1, 1874.
- Sterlingbush Furnace, Jefferson Iron Co., Sterlingbush, Lewis county. Office at Antwerp. Agents, Crocker Brothers, 32 Cliff st., New York. One stack, 32 x 9; cold blast; water-power; built in 1852; annual capacity, 1,500 net tons. Out of blast in 1875. *See Sterlingville Furnace.*
- Sterlingville Furnace, Jefferson Iron Co., Sterlingville, Jefferson county. Office at Antwerp. One stack, 30 x 9; cold blast; water-power; built in 1866; annual capacity, 1,500 net tons. In blast in 1875. *See Sterlingbush Furnace. See Forges.*
- Wassaic Furnace, N. Gridley & Son, Wassaic, Dutchess county. One stack, 32 x 9½; warm blast; water-power; built in 1826; annual capacity, 4,000 net tons. Not running since March 1, 1875.
- Number of charcoal furnaces: 16 stacks. Total number of furnaces in New York: 57 completed stacks, and 1 building.

NEW JERSEY.

ANTHRACITE.

- Andover Iron Works, Andover Iron Co., Joseph C. Kent, Superintendent, Phillipsburg, Warren county. Office, 407 Walnut st., Philadelphia: J. Wesley Pullman, Secretary. Three stacks: two, 60 x 18, and one, 75 x 18, built in 1848; total annual capacity, 38,000 net tons.
- Boonton Iron Works, Fuller, Lord & Co., Boonton, Morris county. Two stacks, 70 x 14 and 60 x 16, built in 1848 and 1868, respectively; bell-and-hopper tops; steam and water power; total annual capacity, 25,000 net tons. *See Rolling Mills.*
- Franklin Furnace, Franklin Iron Co., Franklin Furnace, Sussex county. One stack, 67 x 23; closed top; completed in October, 1873, and blown in January 1, 1874. Moses Taylor, President; E. F. Hatfield, Jr., Treasurer, and W. W. Pierce, Secretary.
- Hackettstown Iron and Manufacturing Co., Hackettstown, Warren county. One stack, 55 x 15, built in 1874-5, put in blast in 1875; annual capacity, 10,000 net tons. Z. P. Boyer, President; George Johnson, Treasurer; Caleb Valentine, Secretary, and H. M. Law, Superintendent.
- Musconetcong Iron Works, A. Pardee & Co., Stanhope, Sussex county. A. Pardee, President, and H. H. Wilson, Treasurer, 303 Walnut st., Philadelphia. Two stacks, 70 x 17 and 80 x 20, built in 1865 and 1871;

closed tops; total annual capacity, 30,000 net tons. G. G. Palmer, Superintendent.

Oxford Iron Works, Oxford Iron Co., Oxford, Warren county. Two stacks, 50 x 10 and 63 x 18, built in 1742 and 1871, respectively; combined annual capacity, 17,000 net tons. *See Rolling Mills.*

Pequest Iron Works, Pequest Mining and Manufacturing Co., Belvidere, Warren county. One stack, 58 x 16, built in 1874; blown in October 27, 1874.

Port Oram Furnace, A. Pardee, lessee, Port Oram, Morris county. One stack, 60 x 16, built in 1869; in blast since June, 1872; annual capacity, 12,000 net tons. E. S. Moffat, Superintendent.

Ringwood Furnaces, Cooper, Hewitt & Co., Ringwood, Passaic county. Office, 17 Burling Slip, New York. Two stacks, 48 x 13 and 65 x 16; not in blast for several years. The former was recently altered from charcoal to anthracite; the latter was partly torn down to be rebuilt for anthracite; both have open tops and are operated by water-power.

Sesaucus Iron Co., Sesaucus, Hudson county. Building one stack, 65 x 17. A. Pardee, President, 303 Walnut st., Philadelphia.

SPIEGELEISEN FURNACES.

New Jersey Zinc Co., Newark, Essex county. Office, 61 Maiden Lane, New York. Built in 1855, 1863 and 1871; three stacks, each 20 x 7; anthracite; open tops; combined annual capacity, 6,600 net tons. Manufacture spiegeleisen at these furnaces from zinc residuum. President, Edward Baker; Vice-President, R. R. Graves, and Secretary, A. H. Farlin.

Number of furnaces in New Jersey: 18 completed stacks, and 1 building.

PENNSYLVANIA.

LEHIGH VALLEY ANTHRACITE.

Allentown Iron Works, Allentown Iron Co., Allentown, Lehigh county. Office, 230 South Third st., Philadelphia. Five stacks: one 45 x 12, one 45 x 14, two 52 x 16, and one 60 x 17, built in 1846, 1847, 1852, 1855, and 1872, respectively; total weekly capacity, 1,050 net tons; annual capacity, 54,600 tons.

Allentown Rolling Mill Co., Allentown. Office, 303 Walnut st., Philadelphia. Two stacks, each 68 x 15, built in 1864; open tops; annual capacity, 20,000 net tons. Formerly owned by Roberts Iron Co. *See Rolling Mills.*

Bethlehem Iron Works, Bethlehem Iron Co., Bethlehem, Northampton county. Six stacks, built in 1863, 1867, 1868, 1874, and 1875; dimensions, 62 ft. 5 in. x 15ft., 45 x 15, 50 x 14 ft. 5 in., 31½ x 10½, 70 x 18, and

70 x 18. The fourth furnace, $31\frac{1}{2} \times 10\frac{3}{4}$, makes spiegeleisen, and was first put in blast August 4, 1875. *See Rolling Mills.*

Carbon Iron Works, Carbon Iron Co., Parryville, Carbon county. Three stacks, 52 x 12, 52 x 16, and 65 x 18, built in 1855, 1864 and 1869, respectively. One open and 2 closed tops; total annual capacity, 34,000 net tons. Dennis Bauman, President and Manager, and Alexander W. Butler, Secretary.

Coleraine Iron Works, W. T. Carter & Co., Redington, Northampton county. Office, 103 Walnut st., Philadelphia. Two stacks, each 60 x 17, built in 1869 and 1872; combined weekly capacity, 500 net tons; annual capacity, 26,000 tons. *See Tamaqua Rolling Mill.*

Crane Iron Works, Crane Iron Co., Catasauqua, Lehigh county. Office, 224 South Fourth st., Philadelphia. Six stacks, 45 x 11, 45 x 13, 55 x 16, 55 x $17\frac{1}{2}$, 55 x $17\frac{1}{2}$, and 60 x $17\frac{1}{2}$; built in 1840, 1842, 1846, 1850, 1850, and 1867, respectively; open tops; total annual capacity, 60,000 net tons. Geo. A. Wood, President; Geo. T. Barns, Secretary; B. J. Leedom, Treasurer, and Joshua Hunt, Superintendent.

Durham Iron Works, Cooper, Hewitt & Co., Riegelsville, Bucks county. Office, 17 Burling Slip, New York. One stack, 76 x 20, built in 1874. The two old stacks, 48 x 13 and 50 x 15, built in 1848 and 1851, have been torn down and will not be rebuilt.

Emaus Furnace, C. H. Nimson, lessee, Allentown, Lehigh county. One stack, 70 x 16; first put in blast Oct. 10, 1872. Owned by Emaus Iron Co., 258 South Third st., Philadelphia.

Glendon Iron Works, Glendon Iron Co., Easton, Northampton county. Five stacks, 50 x 12, 48 x 14, 50 x 15, 63 x 16, and 72 x 18; built in 1843, 1844, 1850, 1852, and 1869, respectively. No. 1 was rebuilt in 1849. These furnaces are at Glendon, near Easton, except No. 4, which is situated at South Easton. No. 2 and No. 4 are blown by water-power. All closed tops except No. 2. Total annual capacity, 53,000 net tons. Wm. Firmstone, Superintendent. General office, Boston, Mass.

Keystone Furnace, Keystone Iron Co., Easton, Northampton county. One stack, 65 x 16; annual capacity, 10,000 net tons; in course of erection. E. H. Green, President, and Kenneth Robertson, Superintendent. Furnace near Glendon.

Lehigh Iron Works, Lehigh Iron Co., Allentown, Lehigh county. Two stacks, 55 x 16 and 60 x 17; No. 1 completed July 22, 1869, and No. 2, Oct. 21, 1872; total annual capacity, 21,000 net tons. W. H. Ainey, President, and L. R. Unger, Secretary.

Lehigh Valley Iron Works, Lehigh Valley Iron Co., Coplay, Lehigh county. Three stacks, 60 x 14, 55 x 16, and 55 x 16, built in 1853, 1862, and 1868, respectively; open tops; total annual capacity, 30,000 net

- tons. Joseph Laubach, President, and B. S. Levan, Secretary and Manager.
- Lock Ridge Furnaces, Thomas Iron Co., Alburtis, Lehigh county. Two stacks, each 55 x 15, built in 1867 and 1869. *See Thomas Iron Works.*
- Millerstown Iron Co., Macungie, Lehigh county. One stack, 56 x 16, completed in 1874, and blown in Sept. 14, 1874; annual capacity, 10,500 net tons. F. S. Shimer, Agent.
- Northampton Furnace, Northampton Iron Co., Freemansburg, Northampton county. Office at South Bethlehem. One stack, 65 x 16, built in 1872; put in blast July 18, 1873; closed top; annual capacity, 10,000 net tons. John Knecht, President, and E. P. Wilbur, Secretary and Treasurer.
- North Penn Furnace, North Penn Iron Co., Bingen, Northampton county. One stack, 63 x 18. Enoch Phillips, Superintendent.
- Saucon Furnaces, Saucon Iron Co., Hellertown, Northampton county. Two stacks, 50 x 16, and 60 x 16, put in operation March 25, 1868, and May 25, 1870, respectively; open tops; total annual capacity, 20,000 net tons. G. W. Whitaker, President and Manager; M. Fackenthall, Secretary, and Jacob Riegel, Treasurer.
- Thomas Iron Works, Thomas Iron Co., Hokendauqua, Lehigh county. Six stacks; four, 60 x 18, and two, 55 x 18; two were built in 1855, two in 1863, and two in 1873; total annual capacity, 80,000 net tons. Samuel Thomas, President; J. T. Knight, Secretary and Treasurer, and John Thomas, General Superintendent. *See Lock Ridge Furnaces.*
- Uhler Furnace, Peter Uhler, owner, and A. Evans, Jr., lessee, Easton, Northampton county. One stack, 74 x 15, built in 1872; closed top; bell and hopper; annual capacity, 7,500 net tons.
- Number of anthracite furnaces in the Lehigh region: 50 completed stacks, and 1 building.

SCHUYLKILL VALLEY ANTHRACITE.

- Anvil Furnace, Pottstown Iron Co., Pottstown, Montgomery county. One stack, 60 x 16, built in 1867; closed top; annual capacity, 10,000 net tons. *See Rolling Mills.*
- Bechtelsville Furnace, Bechtelsville Iron Co., Bechtelsville, Berks county. One stack, 63 x 16, built in 1875; annual capacity, 11,500 net tons. Eli S. Bechtel, President, and Wm. H. Berlin, Secretary and Superintendent.
- East Penn Iron Co., Lyons, Berks county. Two stacks, each 48 x 12½, built in 1874-5.
- Edgehill Furnace, Edgehill Iron Co., Fitzwatertown, Montgomery county. Office, No. 43 North Water st., Philadelphia. One stack, 65 x 16, built in 1872. Wm. Stokes, Treasurer.

Hampton Furnace, E. & G. Brooke, Birdsboro, Berks county. One stack, 30 x 8, built in 1846. Changed recently from charcoal. *See Keystone Furnaces.*

Henry Clay Furnaces, Eckert & Bro., Reading, Berks county. Two stacks, 45 x 12, built in 1844; total annual capacity, 13,000 net tons; closed tops.

Keystone Furnaces of Reading, Keystone Furnace Co., Reading, Berks county. Two stacks: one, 50 x 15, built in 1869; the other, 50 x 14, built in 1872-3, blown in during June, 1873; closed tops; total annual capacity, 20,500 net tons. Jacob Bushong, President; H. M. Bushong, Secretary and Treasurer, and Jacob K. Spang, Manager.

Keystone Furnaces, E. & G. Brooke, Birdsboro, Berks county. Three stacks: two, 43½ x 12 and 55 x 15, built in 1853 and 1871, respectively; one stack, 60 x 16, built in 1873, has a capacity of 225 net tons per week. *See Rolling Mills. See Hampton Furnace.*

Kutztown Furnace, Kutztown Iron Co., Kutztown, Berks county. One stack, 54 x 15½, built in 1875. Thomas Wren, President, and John Humbert, Secretary.

Leesport Furnace, Leesport Iron Co., Leesport, Berks county. One stack, 45 x 14, built in 1853; weekly capacity, 200 net tons.

Lucinda Furnace, Schall & Co., Norristown, Montgomery county. One stack, 39 x 12, built in 1856. *See Rolling Mills.*

Merion Furnaces, J. B. Moorhead & Co., Conshohocken, Montgomery county. Office, 230 South Third st., Philadelphia. Two stacks: Merion Furnace, 40 x 12½, built in 1847; Elizabeth Furnace, 50 x 15, built in 1872, put in blast October 24, 1872; capacity about 350 net tons per week. Both these furnaces were idle from January to September, 1875. Merion Furnace was blown in on September 1st, and makes about 150 tons weekly.

Mill Creek Furnace, Mill Creek Iron Co., Port Carbon, Schuylkill county. One stack, 52 x 13¾, built in 1872, and put in blast in September, 1872. Formerly called Port Carbon Furnace. *See Rolling Mills.*

Minersville Furnace, Minersville Coal and Iron Co., Minersville, Schuylkill county. One stack, 55 x 15, built in 1872-3; blown in September 5, 1873; bell-and-hopper top; iron stack; weekly capacity, 200 net tons.

Monocacy Furnace, Monocacy Iron Co., Monocacy, Berks county. One stack, 50 x 14; annual capacity, 7,000 net tons.

Montgomery Furnace, Montgomery Iron Co., Port Kennedy, Montgomery county. Office, 216 South Fourth st., Philadelphia. One stack, 50 x 14, built in 1854. Abm. S. Patterson, Secretary and Treasurer.

Moselem Furnace, Moselem Iron Co., Moselem, Berks county. One

- stack, 48 x 12½, built in 1823, and rebuilt in 1872; closed top; annual capacity, 5,500 net tons. Wm. L. McDowell, President; G. Malin, Secretary, and Nicholas Hunter, Manager.
- Mt. Laurel Furnace, Clymer Iron Co., Temple, Berks county. One stack, 50 x 11, built in 1836, rebuilt in 1847, and changed to anthracite in 1873; closed top; annual capacity, 5,000 net tons. Wm. H. Clymer, President, and Hiester Clymer, Secretary. *See Charcoal Furnaces.*
- Norristown Iron Works, James Hooven & Sons, Norristown, Montgomery county. One stack, 55 x 16, built in 1869; open top; annual capacity, 10,000 net tons. James Hooven, owner. *See Rolling Mills.*
- Philadelphia Furnace, S. Robbins & Son, Beach and Vienna sts., Kensington, Philadelphia. One stack, 58 x 14, built in 1873. *See Rolling Mills.*
- Phoenix Iron Works, Phoenix Iron Co., Phoenixville, Chester county. Office, 410 Walnut st., Philadelphia. Three stacks, 48 x 14, 36 x 15, and 50 x 14; two built in 1845, and the third in 1849. *See Rolling Mills.*
- Pioneer Furnaces, Atkins Bros., Pottsville, Schuylkill county. Three stacks, 50 x 12, 50 x 13, and 55 x 15, built in 1853, 1866, and 1872, respectively. *See Rolling Mills.*
- Plymouth Furnaces, Plymouth Iron Co., S. Fulton, Agent, Conshohocken, Montgomery county. Office, 265 South Fourth st., Philadelphia. Two stacks, 44 x 15 and 42 x 15, built in 1845 and 1864, respectively.
- Reading Iron Works, Seyfert, McManus & Co., Reading, Berks county. Office, 631 Chestnut st., Philadelphia. Two stacks, 55 x 15 and 55 x 16, built in 1854 and 1874, respectively; the new one was first blown in October 5, 1874; bell-and-hopper tops; total annual capacity, 20,000 net tons. *See Rolling Mills.*
- Ringgold Iron & Coal Co., New Ringgold, Schuylkill county. One stack, 52 x 14, built in 1873; blown in February 28, 1874; annual capacity, 7,000 net tons. Edward Silliman, President; J. Albert Huntzinger, Treasurer, and Edwin Harris, Superintendent.
- Robesonia Furnaces, White & Ferguson, Robesonia, Berks county. Two stacks, 30 x 9 and 38 x 13, built in 1845 and 1858, respectively.
- Sheridan Furnaces, Wm. M. Kaufman & Co., Sheridan, Lebanon county. Two stacks; one very old, and the other, 55 x 16, built in 1874-5.
- St. Clair Furnace, James Lanigan, Pottsville, Schuylkill county. Office, 329 Walnut st., Philadelphia. One stack, 55 x 16; bell-and-hopper top. *See Swede Furnaces.*
- Swede Furnaces, James Lanigan, Swedeland, Montgomery county. Office, 329 Walnut st., Philadelphia. Two stacks, each 60 x 16, built from 1850 to 1855. *See St. Clair Furnace.*
- Topton Furnace, Topton Iron Co., Reading, Berks county. One stack, 55 x 16, built in 1873. Levi H. Leiss, President.

Temple Furnace, Temple Iron Co., Temple, Berks county. One stack, 45 x 13½, built in 1867. Jerome L. Boyer.

Warwick Furnace, Warwick Iron Co., Pottstown, Montgomery county. One stack, 55 x 16, built in 1875; annual capacity, 15,000 net tons. Griffith Jones, Secretary.

Wm. Penn Furnaces, D. O. & H. S. Hitner, Conshohocken, Montgomery county. Three stacks, 35 x 12, 50 x 14, and 40 x 12½, built in 1844, 1845, and 1854.

Number of anthracite furnaces in the Schuylkill region: 50 stacks.

PROJECTED.

One stack at Chester, Delaware county, 16-foot bosh, by the Chester Iron Furnace Co.

UPPER SUSQUEHANNA ANTHRACITE.

Bloom Furnace, Wm. Neal & Sons, Bloomsburg, Columbia county. One stack, 50 x 14, built in 1853-4, and blown in in April, 1854; open top; annual capacity, 9,000 net tons.

Chulasky Furnace, Waterman & Beaver, Chulasky, Northumberland county. Offices, Danville, and 407 Library street, Philadelphia. One stack, 42 x 15, built in 1846. *See Penna. Iron Works. See Rolling Mills.*

Columbia Furnaces, Grove Brothers, Danville, Montour county. Two stacks, 39 x 14 and 50 x 14, built in 1840 and 1860, respectively; open tops; total annual capacity, 13,756 net tons.

Duncannon Furnace, Duncannon Iron Co., Duncannon, Perry county. Office, 122 Race st., Philadelphia. One stack, 40 x 14, built in 1853. *See Rolling Mills.*

Irondale Furnaces, Bloomsburg Iron Co., Bloomsburg, Columbia county. Branch office, 122 Race st., Philadelphia. Two stacks, 36 x 12, built in 1844 and 1845; open tops; water-power; total annual capacity, 12,000 net tons. Charles R. Paxton, President; Wm. E. S. Baker, Treasurer, and E. R. Drinker, Manager.

Lackawanna Iron Works, Lackawanna Iron and Coal Co., Edward C. Lynde, Secretary, Scranton, Luzerne county. Five stacks; two built in 1849, one in 1852, one in 1854, and one in 1872; two are 50 x 18, one is 80 x 18, one 50 x 19, and one 67 x 23. *See Rolling Mills.*

Lewistown Furnaces, Glamorgan Iron Co., Lewistown, Mifflin county. Two stacks, 46 x 12 and 54 x 14½; one built in 1868; one, built in 1872, put in blast in December, 1872; total annual capacity, 12,000 net tons; fuel, anthracite and coke, mixed. Percival Roberts, President; A. S. Roberts, Treasurer; Orleans Longacre, Manager. Philadelphia office, 265 South Fourth st.

Marshall Furnace, Marshall Iron Co., Newport, Perry county. One

- stack, 50 x 14, built in 1872; closed top; annual capacity, 7,000 net tons. John Marshall, President; Charles S. Hinchman, Vice-President, and W. Price Davis, Secretary and Manager.
- Mansfield Furnace, Shaaber & Johnston, Reading, Pa. Furnace at Mansfield, Tioga county. Part of Tioga Iron Works, W. G. Lutz, Superintendent. One stack, 36 x 10, built in 1854.
- Matilda Furnace, B. B. Thomas, Mount Union, Huntingdon county. Office, 430 Walnut st., Philadelphia. One stack, 42½ x 10, built in 1837; annual capacity, 3,500 net tons. Charles E. Sackett, Superintendent.
- Northumberland Furnace, James S. Marsh & Co., Northumberland, Northumberland county. One stack, 61 x 18, built in 1873-4; has never been in blast.
- Pennsylvania Iron Works, Waterman & Beaver, Danville, Montour county. Office, 407 Library st., Philadelphia. Three stacks: two 50 x 16, and one 34 x 14, built in 1842. *See Rolling Mills.*
- Rebecca Furnace, Johnston & Hemphill, Martinsburg, Blair county. One stack, 30 x 8½, built in 1820. *See Gap (bituminous) Furnace.*
- Union Furnace, Beaver, Marsh & Co., Winfield, Union county. One stack, 50 x 15, built in 1854; open top; annual capacity, 7,000 net tons. Dr. L. Rooke, Manager.
- Union Furnaces, Hancock Steel and Iron Co., Danville, Montour county. Two stacks, 38 x 14 and 60 x 16, built in 1867; estimated annual capacity, 14,000 net tons. These furnaces were formerly known as the Danville Furnaces, and afterwards as the National Iron Company's Furnaces. *See Rolling Mills.*
- Number of anthracite furnaces in the Upper Susquehanna region: 25 stacks.

LOWER SUSQUEHANNA ANTHRACITE.

- Aurora Furnace, Wrightsville Iron Co., Wrightsville, York county. One stack, 38 x 14, built in 1867. Wm. McConkey, President.
- Baldwin Furnace, Pennsylvania Steel Co., Steel Works P. O., Dauphin county. Office, 216 South Fourth st., Philadelphia. One stack, 60 x 14, built in 1872-3; put in blast in October, 1873. A second stack building in 1875. *See Rolling Mills.*
- Cameron Furnace, Cameron Furnace Co., Middletown, Dauphin county. One stack, 48 x 13½, built in 1857; 3 tuyeres; closed top; bell and hopper; use York and Cumberland hematite. James Young, President, and J. H. Landis, Treasurer.
- Chestnut Hill Furnaces, Chestnut Hill Iron Ore Co., Columbia, Lancaster county. Three stacks; two, 46 x 16, and one, 46 x 11; total annual capacity, 20,000 net tons. C. J. Nourse, Superintendent.

Chickies Furnaces, E. Haldeman & Co., Chickies, Lancaster county.

Two stacks, 45 x 11 and 45 x 13, built in 1845 and 1854.

Coleman's (R. W.) Heirs, Cornwall, Lebanon county. Five stacks: Bird Coleman Furnace, 52 x 15, built in 1872-3. Cornwall Anthracite Furnaces, two stacks, each 38 x 12, built in 1850 and 1854. Donaghmore Furnace, 44 x 14, built in 1855. North Cornwall Furnace, 52 x 15, built in 1873-4 by Mrs. M. C. Freeman. A. Wilhelm, Attorney. *See Charcoal Furnaces.*

Conestoga Furnace, Thomas & Peacock, Lancaster, Lancaster county.

Office, 430 Walnut st., Philadelphia. One stack, 38 x 10, built in 1846; annual capacity, 6,000 net tons.

Dauphin Furnace, George Malin, Dauphin, Dauphin county. One stack, rebuilt in 1872.

Dock Iron Works, Gilliard Dock & Co., Harrisburg, Dauphin county.

One stack, 40 x 11, built in 1873-4; closed top; annual capacity, 5,000 net tons. Has never been in blast.

Donegal Furnace, Benson & Cottrell, Marietta, Lancaster county. Office at Columbia. One stack, 36 x 12; open top; built in 1848; annual capacity, 6,500 net tons.

Harrisburg Furnace, A. Price's Heirs, Pittston. Furnace at Harrisburg, Dauphin county. One stack, 39 x 12, built in 1844; formerly Porter Furnace; open top; annual capacity, 6,000 net tons. Out of blast in 1875.

Kauffman Furnace, C. S. Kauffman, Columbia, Lancaster county. One stack, 36 x 14, built in 1848; open top; annual capacity, 6,500 net tons.

Lebanon Furnaces, G. Dawson Coleman, Lebanon, Lebanon county.

Two stacks, 50 x 14 and 55 x 16, built in 1846 (reconstructed in 1868) and 1872-3, respectively; the new furnace was put in blast in August, 1873. A third stack, 36 x 12, built in 1847, has recently been torn down for the purpose of rebuilding, but work on it has been discontinued.

Charles B. Forney, Manager.

Lebanon Valley Furnace, J. & R. Meily, Lebanon, Lebanon county. One stack, 38 x 12, built in 1868.

Lochiel Furnace, Lochiel Rolling Mill Co., A. J. Dull, Manager, Harrisburg, Dauphin county. One stack, 52 x 14, built in 1873; put in blast in April, 1873; closed top; annual capacity, 7,500 net tons. *See Rolling Mills.*

Marietta Furnace No. 1, Ethelbert Watts, Marietta, Lancaster county.

One stack, 47 x 12, built in 1847; annual capacity, 5,000 net tons.

Marietta Furnace No. 2, William M. Watts, Marietta, Lancaster county.

One stack, 45 x 12, built in 1850.

Middletown Furnace, Lyman Nutting, Middletown, Dauphin county.

Office at Lebanon. One stack, 40 x 12½, built in 1853.

Musselman Furnace, H. Musselman & Son, Marietta, Lancaster county. One stack, 41 x 14, built in 1868; open top; annual capacity, 6,000 net tons. A. H. Musselman, Manager.

Paxton Furnaces, McCormick & Co., Harrisburg, Dauphin county. Two stacks, 43 x 14 and 60 x 14, built in 1855 and 1872; weekly capacity, 300 net tons.

Richmond Furnace, Southern Pennsylvania Railway and Mining Co., Richmond Furnace, Franklin county. One stack, 36 x 9½, built in 1865; open top; annual capacity, 3,000 net tons. Formerly called Mt. Pleasant Iron Works. Thos. B. Kennedy, President; John L. Ritchey, Secretary and Treasurer, and James A. Reside, Manager.

Safe Harbor Furnace, Safe Harbor Iron Co., Samuel M. Wright, Superintendent, Safe Harbor, Lancaster county. One stack, 45 x 14, built in 1848; annual capacity, 8,000 tons; not in blast since 1865; not again to be put in operation until the Columbia and Port Deposit Railroad, now partly built, is completed. *See Rolling Mills.*

Stanhope Furnace, Wynkoop Bros., Pine Grove, Schuylkill county. One stack, 33 x 10, built in 1825; closed top; bell and hopper; annual capacity, 5,200 net tons. E. W. Wynkoop, Manager. Out of blast since June 30, 1874.

St. Charles Furnaces, C. B. Grubb & Son, Columbia, Lancaster county. Office at Lancaster. Two stacks: one, 42 x 14, built in 1853; the other, formerly the Henry Clay, 39 x 11, built in 1845.

Union Deposit Furnace, Henry Landis, Union Deposit, Dauphin county. One stack, 39½ x 11, built in 1854; open top; annual capacity, 5,000 net tons. In the hands of trustees, and will be sold in May, 1876.

Wister Furnace, J. & J. Wister, Harrisburg, Dauphin county. One stack. 45 x 14, built in 1867; open top; annual capacity, 8,000 net tons. Fuel, anthracite and coke, mixed. Jones Wister, Manager.

Number of anthracite furnaces in the Lower Susquehanna region: 36 completed stacks, and 1 building.

SHENANGO VALLEY.—BITUMINOUS COAL OR COKE.

Allen Furnace, Henderson, Allen & Co., Sharpsville, Mercer county. One stack, 50 x 12, built in 1868; first put in operation, October, 1868; annual capacity, 10,000 net tons.

Clara Furnace, Crowther Iron Co., New Castle, Lawrence county. Coke. One stack, 75 x 16; closed top; annual capacity, 16,000 net tons; built in 1872; put in blast in May, 1872. L. Raney, Manager.

Douglas Furnaces, Pierce, Kelley & Co., Sharpsville, Mercer county. Two stacks: one stack, 50 x 12, built in 1871; one stack, 50 x 14, built in 1872; combined annual capacity, 20,000 net tons.

Etna Iron Works, Samuel Kimberly, New Castle, Lawrence county.
Two stacks, built in 1868, each 50 x 12; combined annual capacity, 18,000 net tons.

Fannie Furnace, Wheeler Iron Co., West Middlesex, Mercer county.
One stack, 51½ x 13½, built in 1873; put in blast October 13, 1873; annual capacity, 11,000 net tons.

Keel Ridge Furnace, Kimberly, Carnes & Co., Sharon, Mercer county.
One stack, 55 x 13¾, built in 1869; annual capacity, 12,000 net tons.
See Rolling Mills.

Lawrence Furnace, Foltz & Jordan, New Castle, Lawrence county. One stack, 35 x 8½, built in 1846; fuel, coke and charcoal; open top; not in blast since 1873. Samuel Foltz, Manager.

Middlesex Furnace, Middlesex Furnace Co., West Middlesex, Mercer county. One stack, 45 x 12, built about 1855; annual capacity, 6,000 net tons.

Mt. Hickory Furnaces, Mt. Hickory Iron Co., Sharpsville, Mercer county.
Two stacks, each 50 x 12, built in 1869; combined annual capacity, 18,000 net tons.

Neshannock Furnace, Neshannock Iron Co., New Castle, Lawrence county. One stack, 60 x 15, built in 1872; first put in operation, December 1, 1872; closed top; coke; annual capacity, 15,876 net tons.
W. E. Reis, Manager.

Ormsby Furnace, Ormsby Iron Co., Samuel Kimberly, lessee, Sharpsville, Mercer county. One stack, 50 x 12, built in 1872; blown in in February, 1873; open top; annual capacity, 9,000 net tons.

Sharon Furnace, Boyce, Rawle & Co., Sharon, Mercer county. One stack, 46 x 10½, built in 1845; annual capacity, 9,000 net tons.

Sharpsville Furnace, James Pierce & Sons, Sharpsville, Mercer county.
One stack, 50 x 11, built in 1847; annual capacity, 9,000 net tons.

Shenango Furnaces, Shenango Furnace Co., West Middlesex, Mercer county. Two stacks, each 46 x 10, built in 1859; open tops; combined annual capacity, 17,000 net tons. S. Perkins, Jr., Manager.

Shenango Iron Works, Reis, Brown & Berger, New Castle, Lawrence county. Three stacks, Sophia, Little Pet, and Rosena: two, 65 x 16, and 40 x 9, built in 1872 and 1853, respectively; one, 77 x 20, completed in 1872, put in blast in June, 1873; combined annual capacity, 40,000 net tons. *See Rolling Mills.*

Spearman Furnaces, Spearman Iron Co., Sharpsville, Mercer county.
Two stacks, each 50 x 14, built in 1872; blown in in 1873 and 1875; open tops; combined annual capacity, 24,000 net tons. J. J. Spearman, Manager.

Stewart Furnaces, Stewart Iron Co., Sharon, Mercer county. Formerly

Valley Furnaces. Two stacks; one, 51 x 12 $\frac{3}{4}$, built in 1870, and one 55 x 14, built in 1872; closed tops; combined annual capacity, 20,000 net tons. *See Rolling Mills.*

Wampum Furnace, Wampum Furnace Co., Wampum, Lawrence county. One stack, 50 x 13, built in 1856; open top; bituminous coal and coke; annual capacity, 8,000 net tons. Edward Kay, Manager.

Westerman Furnaces, Westerman Iron Co., Sharon, Mercer county. Two stacks, each 50 x 13, built in 1865 and 1866; combined annual capacity, 18,000 net tons. *See Rolling Mills.*

Wheatland Furnaces, James Wood's Sons & Co., Wheatland, Mercer county. Four stacks, built from 1860 to 1865; one, 46 x 9, and three, 46 x 12; combined annual capacity, 30,000 net tons. Three of these stacks were leased by Herron, Ohl & Co., to work up stock bought at the public sale of Trustees of James T. & Charles A. Wood. Their lease expired September 5, 1875, and all the stacks are now idle. *See Rolling Mills.*

Number of raw coal and coke furnaces in the Shenango region: 32 stacks.

ALLEGHENY COUNTY.—COKE.

Clinton Furnace, Graff, Bennett & Co., Pittsburgh. One stack, 45 x 12, built in 1859; annual product, 12,000 net tons. *See Rolling Mills.*

Eliza Furnaces, Laughlin & Co., Pittsburgh. Two stacks, built in 1861; originally 45 x 12, but in 1873 and 1874 they were enlarged to 60 x 17, with a total yearly capacity of 36,000 net tons.

Isabella Furnaces, Isabella Furnace Co., Etna. Two stacks, 75 x 18 and 75 x 20, built in 1872; closed tops; annual capacity, 75,712 net tons. Benjamin Crowther, Manager.

Lucy Furnace, Lucy Furnace Co., (Carnegie Brothers & Co., owners,) Pittsburgh. One stack, 75 x 20, first put in blast in May, 1872; closed top; annual capacity, 41,280 net tons. Thomas M. Carnegie, President; Henry Phipps, Jr., Secretary and Treasurer, and James Skelding, Manager.

Shoenberger Furnaces, Shoenberger, Blair & Co., Pittsburgh. Two stacks, 62 x 13, built in 1865; closed tops; total annual capacity, 28,000 net tons.

Soho Furnace, Moorhead, McCleane & Co., Pittsburgh. One stack, 65 x 19, built in 1872; put in blast in November, 1872; annual capacity, 22,000 net tons.

Superior Furnaces, Harbaugh, Mathias & Owens, Wood's Run. Addressed at Pittsburgh. Two stacks, 45 x 12, built in 1862-3; total annual capacity, 22,000 net tons. Out of blast in 1875. *See Rolling Mills.*

Number of coke furnaces in Allegheny county: 11 stacks.

RAW BITUMINOUS COAL OR COKE.—STATE.

Allegheny Furnace, S. C. Baker, Altoona, Blair county. Coke. One stack, 32 x 9, built in 1811.

Blair Iron and Coal Co., Hollidaysburg, Blair county. General office, 218 South Fourth st., Philadelphia. Four stacks. Bennington Furnace, at Bennington, Blair county, 40 x 9½, built in 1856; No. 1 and No. 2, at Hollidaysburg, 43 x 12 and 41 x 11, respectively, built in 1856; and Frankstown Furnace, at Frankstown, Blair county, 40 x 10, rebuilt in 1872, and put in blast November 1, 1872, now temporarily running on spiegeleisen for the Cambria Iron Co.'s steel works. All use coke; closed tops; combined annual capacity, 21,000 net tons. President, Dr. Charles Stewart Wurts, Philadelphia; Secretary and Treasurer, W. S. Robinson, Philadelphia, and Manager, W. R. Babcock, Hollidaysburg.

Brady's Bend Furnaces, Brady's Bend Iron Co., Brady's Bend, Armstrong county. Four stacks, 44 x 9, 44 x 10½, 50 x 14, and 50 x 13½, built from 1842 to 1845; coke; 2 open tops, and 2 closed; total annual capacity, 20,000 net tons. Not in blast in 1875. *See Rolling Mills.*

Cambria Iron Works, Cambria Iron Co., Johnstown, Cambria county. Office, 218 South Fourth st., Philadelphia. Coke. Six stacks. Five stacks at Johnstown: three, 48 x 13, one, 70 x 15, and one 75 x 20; four built from 1852 to 1854, and one built in 1872-5; one stack at Conemaugh Station, two miles east, 45 x 12, built in 1857, now being remodeled to make spiegeleisen from domestic ores. *See Rolling Mills.*

Charlotte Furnace, Everson, Knap & Co., Scottdale, Westmoreland county. One stack, 65 x 16; coke; built in 1872-3; put in blast October 14, 1873; annual capacity, 13,000 net tons.

Dunbar Furnace, Parrish & Hazard, lessees, Dunbar, Fayette county. One stack, 58 x 15½, built in 1790, and rebuilt in 1870; use Connellsville coke and native ores; old stack was called "Union;" actual product for past 12 months, ending in the fall of 1875, 14,855 net tons.

Elizabeth Furnace, Martin Bell & Co., Sabbath Rest, Blair county. Coke. One stack, 32 x 9, put in blast in the fall of 1872, after a long rest.

Fairchance Furnace, Fairchance Iron Co., Uniontown, Fayette county. Coke. One stack, 45 x 13, built in 1784, and rebuilt in 1871. *See Charcoal Furnaces.*

Gap Furnace, Johnston & Hemphill, McKee, Blair county. One stack, 36 x 10. *See Rebecca Furnace, Upper Susquehanna.*

Howard Furnace, Lauth, Thomas & Co., Howard, Centre county. Coke. One stack, 33 x 8, repaired in 1872; annual capacity, 5,000 net tons. *See Rolling Mills and Charcoal Furnaces.*

Juniata Furnace, Williamsburg Manufacturing Co., Williamsburg, Blair county. One stack, 28 x 8½, built in 1857; open top; Connellsville coke; water-power; annual capacity, 2,500 net tons. President, A. M. Lloyd; Secretary, Robert Stewart; Treasurer, Wm. A. Fluke, and Manager, George Fay.

Kemble Furnaces, Kemble Coal and Iron Co., Riddlesburg, Bedford county. Wm. Lauder, Superintendent, Riddlesburg. General office, 20 Nassau st., New York, address P. O. Box 157. Two stacks, 60 x 14, built in 1869 and 1870; the first was put in blast July 4, 1869, and the second, March 4, 1871; closed tops; total annual capacity, 18,000 net tons. Coke, from washed coal. R. P. Parrott, President, and R. A. Wight, Secretary, New York.

Le Monte Furnace, Le Monte Furnace Co., Uniontown, Fayette county. One stack, 65 x 15, built in 1875; use Connellsville coke and native ores; annual capacity, 14,000 net tons.

Mahoning Furnace, J. A. Colwell & Co., Oakland, Armstrong county. One stack, 40 x 10½, built in 1845; closed top; coke; annual capacity, 3,900 net tons.

Monticello Furnace, Assignees of McKnight, Porter & Co., Monticello, Armstrong county. Coke. One stack, 53 x 11½, built in 1859; annual capacity, 7,000 net tons.

Oliphant Furnace, F. H. Oliphant, Uniontown. One stack, 50 x 11, building in 1875. Coke.

Pine Creek Furnace, Brown & Mosgrove, Kittanning, Armstrong county. One stack, 47 x 11, built in 1846; open top; coke; annual capacity, 3,800 net tons. John P. Painter, Manager.

Red Bank Furnace, Reynolds & Moorhead, Red Bank Furnace, Clarion county. Coke. One stack, 40 x 11, built in 1859.

Rock Hill Furnaces, Rock Hill Iron and Coal Co., Orbisonia, Huntingdon county. Office, 320 Walnut st., Philadelphia: Wm. A. Ingham, President. Two stacks, each 65 x 17, built in 1873-5; total annual capacity, 22,000 net tons. Coke.

Rodman Furnaces, Charles Knap & Co., Roaring Springs, Blair county. Two stacks, 42 x 9 and 45 x 14; coke; total annual capacity, 10,500 net tons.

Sligo Furnace, J. P. Lyon & Co., Sligo, Clarion county. Coke. One stack, 32 x 9, rebuilding in 1873-4. See *Madison (charcoal) Furnace*.

Stewardson Furnace, F. B. & A. Laughlin, Mahoning, Armstrong county. One stack, 43½ x 11, built in 1851; coke; open top; annual capacity, 4,000 net tons.

Number of raw coal or coke furnaces in Pennsylvania, outside of Allegheny county and the Shenango region: 35 completed stacks, and 1 building.

CHARCOAL.—STATE.

Augusta Furnace, Harrisburg and Potomac Railroad Co., D. V. Ahl, President, Newville, Cumberland county. Furnace near Shippensburg. One stack, not in blast for several years, but intended to be rebuilt and put in operation when business revives.

Barree Furnace, Estate of A. L. Mumper, Barree Forge, Huntingdon county. One stack, 33 x 9, built in 1863; hot blast; open top; water-power; annual capacity, 2,000 net tons. *See Bloomaries.*

Big Pond Furnace, Philadelphia and Reading Coal and Iron Co., Newville, Cumberland county. One stack, 33 x 8½, built in 1836.

Carlisle Iron Works, C. W. & D. V. Ahl, Boiling Springs, Cumberland county. Office at Carlisle. One stack, 28 x 8½, built in 1776 and rebuilt in 1810; hot and cold blast; water-power; annual capacity, 2,000 net tons. *See Bloomaries.*

Carrick Furnace, R. M. Shalter, Fannettsburg, Franklin county. One stack, 30 x 8, built in 1828; annual capacity, 1,800 net tons.

Chestnut Grove Furnace, Jesse R. Group, Idaville, Adams county. One stack, 30 x 8½, built in 1830; cold blast; closed top; annual capacity, 1,000 net tons. Out of blast in 1875.

Cornwall Furnace, R. W. Coleman's Heirs, Cornwall, Lebanon county. One stack, 31 x 8, built in 1745. A. Wilhelm, Attorney. *See Lower Susquehanna Furnaces.*

Eagle Furnace, C. Curtin & Co., Roland, Centre county. One stack, 28 x 7½, built in 1848; open top, open hearth, and closed tuyère; cold blast; water-power; annual capacity, 1,800 net tons. *See Rolling Mills and Bloomaries.*

East Penn Furnace, John Balliet, Parryville, Carbon county. One stack, 28 x 7½, built in 1837; cold blast; water-power.

Emma Furnace, Logan Iron and Steel Co., Lewistown, Mifflin county. Office, 218 South Fourth st., Philadelphia. One stack, 34 x 9; warm and cold blast. *See Rolling Mills and Bloomaries. See Greenwood Furnaces.*

Erie Furnace, Rawle, Noble & Co., Erie, Erie county. One stack, 55 x 9½, built in 1869; hot blast; annual capacity, 8,000 net tons. Run on soft coal for several years; now charcoal.

Etna Furnace, George D. Isett & Bro., Yellow Springs, Blair county. One stack, 31 x 8; cold blast; built in 1808. *See Bloomaries.*

Franklin Furnace, Hunter & Springer, St. Thomas, Franklin county. One stack, 32 x 7½, built in 1828; cold blast; annual capacity, 1,500 net tons.

Greenwood Furnaces, Logan Iron and Steel Co., Greenwood Works, Huntingdon county. Office, 218 South Fourth st., Philadelphia. Two

- stacks, 30 x 8½, and 32 x 8½; cold blast. *See Rolling Mills and Bloomaries. See Emma Furnace.*
- Hecla Furnace, McCoy & Linn, Milesburg, Centre county. One stack, 32 x 9, built in 1820; cold blast; water-power. *See Rolling Mills and Bloomaries.*
- Hope Furnace, Joseph S. Brown & Co., Rose Point, Lawrence county. One stack, 28 x 8, built in 1868; cold blast.
- Hopewell Furnace, Clingan & Buckley, Douglassville, Berks county. One stack, 30 x 7; very old; cold blast.
- Hopewell Furnace, Lowry, Eichelberger & Sons, Hopewell, Bedford county. One stack, 30 x 8½, built in 1800; warm blast; open top; water-power; annual capacity, 1,600 net tons.
- Howard Furnace, Lauth, Thomas & Co., Howard, Centre county. One stack, 31 x 8½, built in 1833; cold blast; water power. *See Rolling Mills and Bituminous Furnaces.*
- Isabella Furnace, Smith & Bros., Barneston, Chester county. One stack, 33 x 8, built in 1835 and rebuilt in 1864; cold blast; water-power.
- Jefferson Furnace, John M. Kaufman & Bros., Auburn, Schuylkill county. One stack, 31 x 7, built in 1864; cold blast; water-power.
- Joanna Furnace, L. B. Smith & Co., Joanna Furnace, Berks county. One stack, 30 x 8, built in 1792, and rebuilt in 1847; cold blast; water and steam power.
- Laura Furnace, W. A. Taylor & Co., Millerstown, Perry county. One stack, 35 x 9, built in 1873; cold blast; water-power; weekly capacity, 35 net tons.
- Logan Furnace, Valentine & Co., Bellefonte, Centre county. One stack, 32 x 8, built in 1815; cold blast; water-power; open top; annual capacity, 3,000 net tons. *See Rolling Mills.*
- Madison Furnace, J. P. Lyon & Co., Sligo, Clarion county. One stack; cold blast. *See Bituminous Furnaces.*
- Maiden Creek Furnace, Heirs of George Merkel, Lenhartsville, Berks county. One stack, 33 x 9, built in 1834; cold and warm blast; water and steam power; open top; annual capacity, 1,600 net tons.
- Manada Furnace, Grubbs & Bland, Swatara Station, Dauphin county. One stack, 31 x 8, built in 1836; cold blast; water-power.
- Mont Alto Furnace, Mont Alto Iron Co., Mont Alto, Franklin county. One stack, 37½ x 9½, built in 1808; cold and warm blast; open top; annual capacity, 5,000 net tons. I. S. Waterman, President, 407 Library st., Philadelphia, and George B. Wiestling, Superintendent, Mont Alto. *See Bloomaries.*
- Mount Hope Furnace, A. Bates Grubb, Mount Hope, Lancaster county. One stack, 27 x 7, built in 1785; put in blast in 1875, after a rest of several years; cold blast; hot blast soon to be added.

Mount Penn Furnace, Hunsicker & Co., Reading, Berks county. One stack, $30 \times 8\frac{1}{2}$, built in 1830; cold blast; water-power. Out of blast in 1875.

Oley Furnace, Clymer Iron Co., Temple, Berks county. One stack, 30×8 , built in 1772; cold blast; water-power; annual capacity, 1,200 net tons. Wm. H. Clymer, President, and Hiester Clymer, Secretary. *See Schuylkill Valley Furnaces.*

Pennsylvania Furnace, Lyon, Shorb & Co., Graysville, Huntingdon county. One stack, 32×9 , built in 1813. *See Bloomaries.*

Pine Grove Furnace, South Mountain Iron Co., Mountain Creek, Cumberland county. One stack, 33×9 ; open top; hot blast; water-power; annual capacity, 2,000 net tons. Samuel Thomas, President; J. T. Knight, Secretary and Treasurer; Josiah Bachman, Cashier, and S. C. Miller, Superintendent.

Sarah Furnace, Assignees of Essington Hammond, Sarah, Blair county. One stack, $32\frac{1}{2} \times 8\frac{1}{2}$, built in 1824; cold blast; open top; annual capacity, 1,500 net tons. *See Bloomaries.*

Springfield Furnace, John Royer, Royer P. O., Blair county. One stack, $31 \times 8\frac{1}{2}$, built in 1815; hot blast; water-power; open top; annual capacity, 1,600 net tons. A. McAllister, Manager. *See Bloomaries.*

Spring Hill Furnace, Fairchance Iron Co., Smithfield, Fayette county. One stack, 35×9 , built in 1805, rebuilt in 1854, and repaired in 1873. *See Bituminous Furnaces.*

Washington Iron Works, Jacob Yearick, lessee, Lamar, Clinton county. One stack, 30×7 , built in 1809. *See Bloomaries.*

White Deer Furnace, A. Pardee, Watsontown, Union county. Office at Hazleton, Luzerne county. One stack, 35×9 , built in 1846.

York Furnace, John Bair & Co., York Furnace, York county. One stack, 32×8 , built in 1830; cold blast; water-power.

Number of charcoal furnaces in Pennsylvania: 39 stacks. Total number of furnaces in Pennsylvania: 278 completed stacks, and 3 building.

MARYLAND.

CHARCOAL.

Catoctin Furnaces, J. B. Kunkel, Catoctin Furnaces, Frederick county. Two stacks, $32 \times 8\frac{1}{2}$, and 32×9 , built in 1775 and 1856; open tops; warm and cold blast; steam and water power; total annual capacity, 5,000 net tons. *See Coke Furnaces.*

Cedar Point Furnace, Brooke & Fritz, Baltimore, Baltimore county. One stack, 30×8 ; hot blast; built in 1843; closed top; annual capacity, 3,000 net tons. *See Coke Furnaces.*

Chesapeake Furnaces, Wm. F. Pannell, 23 and 25 South Frederick st.,

- Baltimore. Two stacks, 32 x 8, built in 1845 and 1853; warm blast; annual capacity, 5,500 net tons.
- Green Spring Furnace, J. B. Haines & Co., Green Spring, Washington county. One stack, 35 x 8½; warm blast; water-power; built in 1848; open top; annual capacity, 1,200 net tons. .
- Harford Furnace, Clement Dietrich & Sons, Harford Furnace, Harford county. One stack, 28 x 6½, built in 1828; hot blast; steam and water power.
- Laurel Furnace, Estate of Daniel M. Reese, Baltimore. One stack, 52 x 9, built in 1856, and rebuilt in 1873; warm blast; closed top; annual capacity, 4,500 net tons. D. W. & E. S. Reese, Managers.
- La Grange Furnace, E. S. Rogers, Clermont Mills, Harford county. One stack, 32 x 7½, built in 1836; warm blast; water-power.
- Locust Grove Furnace, J. Furstenberg, Rossville, Baltimore county. One stack, 35 x 7½, built in 1844; hot blast.
- Maryland Furnaces, H. W. Ellicott, Baltimore. Two stacks, each 50 x 9, built in 1853 and 1870.
- Muirkirk Furnace, Muirkirk Iron Co., Muirkirk, Prince George's county. One stack, 27 x 8½, built in 1847; hot blast; closed top; oak and pine charcoal; annual capacity, 3,000 net tons. Charles E. Coffin, President, and W. C. Odiorne, Secretary and Treasurer.
- Principio Furnace, Geo. P. Whitaker, Principio, Cecil county. One stack, 33 x 8, built in 1700, and rebuilt in 1835; warm blast; water-power.
- Stickney Furnace, Stickney Iron Co., Baltimore. Formerly called Lazzaretto Furnace. One stack, 50 x 9½; hot blast; built in 1854, and rebuilt in 1871. J. H. Stickney, President, and Wm. Oliver, Jr., Superintendent.
- Number of charcoal furnaces in Maryland: 15 stacks.

ANTHRACITE COAL AND COKE.

- Ashland Furnaces, Ashland Iron Co., Ashland, Baltimore county. Three stacks, 32 x 12, 32 x 12, and 52 x 16, built in 1840 and 1870; Nos. 1 and 2, open top; No. 3, closed top; steam and water power; annual capacity, 22,000 net tons. Walter S. Franklin, Manager.
- Number of anthracite and coke furnaces in Maryland: 3 stacks.

BITUMINOUS COAL AND COKE.

- Antietam Furnace, J. S. Ahl & Co., Sharpsburgh, Washington county. One stack, 50 x 11, built in 1838; water-power. This furnace is for sale.
- Bowery Furnace, Cumberland Coal and Iron Co., Frostburg, Alleghany county. One stack, 56 x 14½, built in 1868, rebuilt in 1873. General Office, 52 Broadway, New York: Wm. M. Richards, President, and J. Richards, Secretary.

- Catoctin Furnace, J. B. Kunkel, Catoctin Furnaces, Frederick county. One stack, 50 x 11½, built in 1873-4; open top; used Connellsville coke in 1875; annual capacity, 6,000 net tons. *See Charcoal Furnaces.*
- Cedar Point Furnace, Brooke & Fritz, Baltimore. One stack, 44 x 12, built in 1873; closed top; coke; annual capacity, 6,000 net tons. *See Charcoal Furnaces.*
- Elk Ridge Furnace, T. H. Brown, Elk Ridge Landing, Howard county. One stack, 32 x 10, rebuilt in 1855; open top; annual capacity, 3,000 net tons. Not in blast since January, 1874.
- Knoxville Furnace, C. S. Maltby, Knoxville, Frederick county. One stack, 41 x 12½; not in blast for several years, but resumed in 1873. Formerly Longacoming Furnace.
- Number of raw coal and coke furnaces in Maryland: 6 stacks. Total number of furnaces in Maryland: 24 stacks.

VIRGINIA.

CHARCOAL.

- Amherst Furnace, Wm. H. Jordan (executor of estate of S. F. Jordan) Big Island, Bedford county. Furnace in Amherst county. One stack, 36 x 9, built in 1863; warm blast; water-power.
- Barren Springs Furnace, Robinson and Graham, Reed Island, Wythe county. One stack, 35 x 8, built in 1853, and rebuilt in 1873; put in blast August 1, 1873; cold blast.
- Brown Hill Furnace, Brown Hill Iron Co., Brown Hill, Wythe county. One stack, 32 x 9; cold blast; water-power.
- Cedar Run Furnace, Graham & Robinson, Graham's Forge, Wythe county. One stack, 32 x 9; cold blast; water-power; built in 1832. *See Rolling Mills and Bloomaries.*
- Clifton Forge Furnace, Howell Fisher, Clifton Forge, Alleghany county. One stack, 34 x 8½; not in blast since 1860; repaired in 1874.
- Columbia Furnace, John Wissler & Son, Columbia, Shenandoah county. One stack, 34 x 11, rebuilt in 1809; cold blast; water-power.
- Glenwood Furnace, New Jersey Iron Co. of Virginia, Glenwood, Rock-bridge county. One stack, 35 x 8½, rebuilt in 1874; open top; warm blast; water-power; annual capacity, 2,000 net tons. President, Theodore F. Randolph, Morristown, New Jersey; Secretary and Superintendent, Ed. N. Kirk Talcott, Glenwood, Va.; Treasurer, Charles Runyon, 111 Broadway, New York.
- Grace Furnace, Tredegar Company, Wm. T. Patton, Agent, Grace Furnace, Botetourt county. One stack, 33 x 9½; cold blast; built in 1850, burned in 1864, rebuilt in 1873, and put in blast in 1874; closed top; annual capacity, 1,600 net tons. *See Rolling Mills.*

- Grey Eagle Furnace, David Huddle, Brown Hill, Wythe county. One stack, 33 x 9, built in 1863; cold blast; water-power; annual capacity, 600 net tons. *See Bloomaries.*
- Laurel Furnace, Peyton & Swop, Cumberland Gap, Tennessee. Furnace in Lee county, Virginia. One stack, 28 x 8, rebuilt in 1873; cold blast; water-power.
- Liberty Furnace, Wissler, Armstrong & Stone, Liberty Furnace, Shenandoah county. One stack, 30 x 8½, built in 1821; cold blast; water-power.
- Mine Run Furnace, Wm. Boyer, Seven Fountains, Shenandoah county. One stack, 32 x 6½; cold blast; water-power; built in 1872.
- Mount Torrey Furnace, N. Halsted, Sheranda, Augusta county. One stack, 32 x 9; hot blast; built in 1804.
- Mount Vernon Iron Works, Wyeth Iron and Steel Co., lessees, Weyer's Cave, Rockingham county. One stack, 35 x 9, built in 1848, and rebuilt in 1874, after a long rest; cold blast; steam and water power; closed top; put in blast August 4, 1875. Wyeth & Brother, proprietors, Baltimore, Maryland. *See Bloomaries.*
- Oxford Iron Works, D. W. Moore, Mount Athos, Campbell county. One stack; hot blast.
- Panic Furnace, Peter Gallagher & Co., Mount Airy, near Wytheville. One stack; cold blast; capacity, 8 net tons per day; built in 1875, and blown in August 9, 1875.
- Panther Gap Furnace, Panther Gap Iron Co., Panther Gap, Rockbridge county. One stack, 38 x 9; cold blast; completed in December, 1874.
- Radford Furnace, Isett & Culbertson, Radford Furnace, Pulaski county. One stack, 35 x 10; warm blast; built in 1868.
- Raven Cliff Furnace, Crockett, Sanders & Co., Wytheville, Wythe county. One stack, 29 x 9, built in 1810; cold blast; water-power. *See Bloomaries.*
- Salisbury Furnace, Salisbury Iron Manufacturing Co., Fincastle, Botetourt county. One stack, 32 x 10, built in 1869; hot and cold blast; open top; water-power; annual capacity, 3,000 net tons. Jacob Dakin, President and Manager.
- Shenandoah Iron Works, Wm. Milnes, Jr., lessee, Shenandoah Iron Works, Page county. One stack, 33 x 9; hot blast; built in 1867; annual capacity, 3,000 net tons. The Shenandoah Iron, Lumber, Mining, and Manufacturing Co. own this and another stack of the same size; the latter not being in blast. *See Bloomaries.*
- Sinking Creek Furnace, Johns Mountain Iron Co., Newport, Giles county. One stack, 35 x 9½, built in 1873; hot blast; water-power.
- Speedwell Furnace, D. E. James & Co., Speedwell, Wythe county. One

stack, 32 x 9, built in 1873-4; cold blast; water-power; open top; not in blast in 1875.

Van Buren Furnace, Frank King, Van Buren Furnace, Shenandoah county. One stack, $37\frac{1}{2} \times 9\frac{1}{2}$, rebuilt in 1870; closed top; cold blast, but arranged for hot; annual capacity, 2,500 net tons.

Victoria Furnace, Ira F. Jordan & Co., Tolersville, Louisa county. One stack, $33 \times 8\frac{1}{2}$, built in 1835; warm blast; open top; annual capacity, 1,200 net tons.

Walton Furnace, Howard & Sanders, Max Meadows, Wythe county. One stack, 33×9 ; cold blast; built in 1872; open top; annual capacity, 1,300 net tons.

Wythe Furnace, Sayers, Oglesby & Co., Wytheville, Wythe county. One stack, built in 1873; cold blast; water-power.

Number of charcoal furnaces in Virginia: 28 stacks.

COKE.

Callie Furnace, D. S. Cook, (of Wrightsville, Pennsylvania,) Clifton Forge, Alleghany county. One stack, 36×9 , built in 1873-4; used charcoal in 1874, but coke in 1875.

Elizabeth Furnace, Elizabeth Iron Co., Elizabeth Furnace P. O., Augusta county. One stack, 35×10 , built in 1862; closed top; annual capacity, 3,200 net tons. President, C. P. Harmon, Washington, D. C.; Treasurer, P. H. Trout, and Manager, R. B. Dunlap.

Lucy Selina Furnace, Longdale Iron Co., Longdale, Alleghany county. One stack, 44×11 , built in 1827, and rebuilt in 1873; hot and cold blast; closed top; runs on either coke or charcoal; water-power; annual capacity, 3,750 net tons. Wm. Firmstone, President, Easton, Pennsylvania; J. E. Johnson, Manager.

Virginia Iron and Steel Co., Buffalo Gap, Augusta county. Two stacks, 35×9 , and $40 \times 10\frac{1}{2}$, built in 1869 and 1873, respectively; open tops; coke and splint coal; total annual capacity, 9,000 net tons. President, H. W. Howell, New York; Secretary and Treasurer, H. J. Rogers, New York; Superintendent, William Bushnell, Buffalo Gap.

Number of coke furnaces in Virginia: 5 stacks.

ANTHRACITE.

Powhatan Iron Works, Powhatan Iron Co., Richmond. Furnace in Henrico county. One stack, 48×13 ; open top; water-power; built in 1860, and rebuilt in 1872-3; annual capacity, 7,000 net tons. Gen. W. F. Bartlett, President and Treasurer, and T. C. Jones, Secretary.

Total number of furnaces in Virginia: 34 stacks.

A number of new furnaces have been "projected" in this State, but careful inquiry fails to show that any of them are likely to be built at present.

NORTH CAROLINA.

CHARCOAL.

Buckhorn Furnace, American Iron and Steel Co., Lockville, Chatham county. One stack, 54 x 10, built in 1873; hot blast; water-power; closed top; annual capacity, 4,500 net tons. George G. Lobdell, President; George G. Lobdell, Jr., Secretary; W. W. Lobdell, Treasurer, and J. H. Wissler, Manager. *See Endor Furnace.*

Endor Furnace, American Iron and Steel Co., Lockville, Chatham county. One stack, 39 x 8; old works remodeled in 1872-3; hot blast; closed top; annual capacity, 2,500 net tons. *See Buckhorn Furnace.*

Madison Furnace, Jonas W. Derr, Lincolnton, Lincoln county. One stack, 32 x 6, built in 1810; cold blast; water power. *See Bloomaries.*

Ore Hill Furnace, Niesbet, Creene & Co., Ore Hill, Chatham county. One stack, 30 x 8; hot blast; built in 1862; stack repaired in 1873; daily capacity increased to 10 tons. *See Gulf (bituminous) Furnace.*

Rehoboth Furnace, Leonard & Benedict, Iron Station, Lincoln county. One stack, 38 x 9½, built in 1810; cold blast; water-power; annual capacity, 1,200 net tons. *See Bloomaries.*

Stonewall Furnace, Estate of Madison Smith, Iron Station, Lincoln county. One stack, 32 x 7, built in 1863; cold blast; water-power; annual capacity, 600 net tons. Not in blast for two years. *See Vesuvius Furnace.*

Vesuvius Furnace, Estate of Madison Smith, Iron Station, Lincoln county. One stack, 32 x 8, built in 1780; cold blast; water-power; annual capacity, 700 net tons. Not in blast for two years. *See Stonewall Furnace.*

Number of charcoal furnaces in North Carolina: 7 stacks.

COKE.

Gulf Furnace, Niesbet, Creene & Co., Ore Hill, Chatham county. One stack, built in 1873-5; has never been in blast. *See Ore Hill (charcoal) Furnace.*

Total number of furnaces in North Carolina: 8 stacks.

GEORGIA.

CHARCOAL.

Bear Mountain Furnaces, Thomas & Brown, Cartersville, Cass county. Furnaces in Bartow county. Two stacks, 32 x 7¾; cold blast; water-power; built in 1842; open tops; annual capacity, 2,400 net tons.

Cherokee Furnace, Trenton, Dade county. One stack, 33 x 9. A. McLean, Agent.

Cherokee Iron Works, Cherokee Iron Co., Cedartown, Polk county.

One stack, $60 \times 12\frac{3}{4}$, built in 1874-5; closed top; hot blast; annual capacity, 8,000 net tons. A. G. West, President and Superintendent; John H. Browning, of New York, Treasurer; W. S. Kenyon, Secretary. Not yet in blast.

Diamond Furnace, W. P. Ward, Cartersville, Cass county. Furnace in Bartow county. One stack, $28 \times 7\frac{1}{2}$; cold blast; built in 1856; water-power.

Etna Furnace, Etna Iron Co., Etna Furnace, Polk county. One stack, 44×10 ; cold blast; built in 1870; capacity, 10 to 12 net tons daily. Alfred Shorter, President; C. M. Pennington, Superintendent, and John E. Stillwell, Assistant Superintendent.

Pool Furnace, B. G. Pool, Cartersville, Cass county. Furnace in Bartow county. One stack, 33×8 , built in 1855; cold blast; water-power.

Ridge Valley Iron Co., Rome, Floyd county. F. I. Stone, President. One stack, 43×10 , built in 1873-4. This furnace is eight miles north of Rome, on the S. R. & D. Railroad.

Rogers Furnace, Rogers Iron Co., Rogers Depot, Bartow county. One stack, 36×9 ; cold blast; built in 1873; open top; annual capacity, 2,500 net tons. President, M. H. Dooly, Atlanta, Ga.; Secretary and Treasurer, W. H. Lumpkin, Rogers Depot.

Number of charcoal furnaces in Georgia: 9 stacks.

COKE.

Bartow Furnaces, Bartow Iron Co., Bartow Iron Works, Bartow county.

Two stacks, 36×9 , and 58×12 , built in 1871 and 1873, respectively; closed tops; annual capacity, No. 1, 2,500 net tons; No. 2, 6,000 net tons. J. C. Haselton, President; J. J. Willard, Secretary, and F. I. Stone, Treasurer and Manager.

Rising Fawn Iron Co., Rising Fawn, Dade county. One stack, 60×16 , built in 1873-5; put in blast June 18, 1875; Whitwell hot blast. W. B. Thomas, Superintendent.

Number of coke furnaces: 3 stacks. Total number of furnaces in Georgia: 12 stacks.

ALABAMA.

CHARCOAL.

Alabama Furnace, Alabama Iron Co., Alabama Furnace, Talladega county. One stack, $41\frac{1}{4} \times 8\frac{3}{4}$; hot blast; built in 1873; open top, with bonnet; annual capacity, 9,000 net tons. Stephen S. Glidden, President and Manager; Horace Ware, Vice-President, and James L. Orr, Treasurer.

Bibb Furnaces, W. E. Johnston, lessee, Brierfield, Bibb county. Two stacks, 40 x 8, built in 1862 and 1864; cold blast.

Cornwall Iron Works, Cornwall Iron Co., Cedar Bluff, Cherokee county. One stack, 44 x 9, built in 1862; cold blast; water-power.

Giles Edwards, Woodstock, Bibb county. One stack building.

McKee Furnace, Jefferson Iron Co., Thomas & Co., lessees, Irondale Furnace, Jefferson county. One stack, 46 x 10½; hot blast; daily capacity, 15 net tons.

Rock Run Furnace, Pleasant Gap, Cherokee county. One stack, 38 x 9, built in 1873-4; put in blast June 1, 1874; hot blast; annual capacity, 4,000 net tons; closed top. Now offered for sale by creditors.

Round Mountain Furnace, Round Mountain Coal and Iron Co., E. A. Williams, President and General Manager, Rome, Georgia. Furnace at Round Mountain, Cherokee county, Alabama. One stack, 45 x 8¾, built in 1853, rebuilt and put in blast in June, 1874, after a long rest; cold blast; closed top; annual capacity, 5,000 net tons. Use red fossiliferous ore, yielding 58 per cent.

Shelby Furnaces, Shelby Iron Co., Shelby Iron Works, Shelby county. Two stacks, 56 x 12 and 60 x 14, built in 1863 and 1873, respectively; warm blast; closed tops; total annual capacity, 13,000 net tons. President, John W. Lapsley; Secretary, Charles J. Hazard, and Superintendent, Walter Crafts.

Stonewall Iron Works, Stonewall Iron Co., Stonewall, Cherokee county. One stack, 40 x 11, built in 1873; hot blast; open top; annual capacity, 6,000 net tons. J. W. Bones, President and Treasurer; Wm. Wurts, Manager.

Tecumseh Furnace, Tecumseh Iron Co., Tecumseh, Cherokee county. One stack, 60 x 12, first put in operation, February 19, 1874; hot blast; open top, but soon to be closed; annual capacity, 10,000 net tons. Willard Warner, President and Manager; A. E. Buck, Secretary and Treasurer.

Woodstock Furnace, Woodstock Iron Co., Anniston, Calhoun county. One stack, 43 x 12, first blown in April 13, 1873; hot and cold blast; closed top; annual capacity, 6,000 net tons. President, Alfred L. Tyler; Secretary and Treasurer, Samuel Noble.

Number of charcoal furnaces in Alabama: 12 completed stacks, and 1 building.

CHARCOAL AND COKE.

Red Mountain Works, James Thomas & Co., Pratt, Jefferson county. Two stacks, each 60 x 12; hot blast; total annual capacity, 18,000 net tons; use fossiliferous ore.

Total number of furnaces in Alabama: 14 completed stacks, and 1 building.

TEXAS.

Jefferson Iron Co., Jefferson, Marion county. One stack, 40 x 9½, built in 1869, rebuilt in 1873-4; hot and cold blast. G. A. Kelly, President. Three furnaces were abandoned at the close of the war. Number of furnaces in Texas: 1 charcoal stack.

WEST VIRGINIA.

COKE.

Belmont Furnace, Belmont Nail Works Co., Wheeling. One stack, 65 x 16, first blown in September 4, 1875; closed top; annual capacity, 18,000 net tons. *See Rolling Mills.*

Lancaster Furnace, Sinsheimer & Co., Irontown, Taylor county. One stack, 50 x 11½, built in 1873; annual capacity, 6,000 net tons.

Martin Iron Works, Estate of George Hardman, Racoon, Preston county. One stack, 40 x 10, built in 1861. *See Charcoal Furnaces.*

Quinnimont Furnace, Bramwell & Forman, Quinnimont, Fayette county. One stack, 60 x 15, built in 1874.

Riverside Furnace, Riverside Iron Works, Wheeling. Furnace in Marshall county. One stack, 60 x 17½, built in 1872; closed top; annual capacity, 21,000 net tons. *See Rolling Mills.*

Wheeling Iron and Nail Co., Wheeling. One stack, 65 x 18, built in 1873-4. *See Rolling Mills.*

Number of coke furnaces in West Virginia: 6 stacks.

CHARCOAL.

Bloomery Furnace, Bloomery Iron Works P. O., Hampshire county. One stack, 30 x 7, built in 1844; put in blast November 1, 1873, after a long rest.

Capon Iron Works, Keller & Co., Capon Iron Works, Hardy county. One stack, 32 x 7, built in 1822. *See Bloomeries.*

Elk River Furnace, Elk River Iron and Coal Co., Strange Creek, Braxton county. One stack, 42 x 11½, built in 1875; cold blast; annual capacity, 5,000 net tons. Put in blast October 1, 1875.

Gladeville Iron Works, Estate of George Hardman, Gladeville, Preston county. One stack, 35 x 7; hot blast; built in 1872. *See Coke Furnaces.*

Kanawha Iron Co., Charleston, Jefferson county. One stack, 48 x 13, built in 1875; closed top; Whitwell hot blast; daily capacity, 40 tons. N. I. Bigley, President, and G. L. Drouillard, Secretary.

Virginia Furnace, Muddy Creek P. O., near Kingwood, Preston county. One stack, 30 x 6, built in 1853; water-power; daily capacity, 3 net tons.

Number of charcoal furnaces in West Virginia: 6 stacks. Total number of furnaces in West Virginia: 12 stacks.

KENTUCKY.

HANGING ROCK DISTRICT.—BITUMINOUS COAL AND COKE.

Ashland Furnace, Lexington and Big Sandy R. R. Co., Douglas Putnam, Jr., Agent, Ashland, Boyd county. One stack, 62 x 15, built in 1869; closed top; raw coal; annual capacity, 15,000 net tons. John Means, President; John G. Peebles, Vice-President; Wm. F. Gaylord, Treasurer, and Robert Peebles, Secretary.

Hunnewell Furnace, Eastern Kentucky Railway Co., A. J. Kizer, Agent, Riverton, Greenup county. One stack, 46½ x 11½, built in 1852; hot blast; open top; annual capacity, 6,000 net tons. *See Pennsylvania (charcoal) Furnace.*

Kentucky Furnace, Norton Iron Works, Ashland, Boyd county. One stack, 67 x 18, built in 1873; blew in February 16, 1874; closed top; annual capacity, 15,000 net tons. *See Rolling Mills.*

Number of bituminous furnaces in Hanging Rock region: 3 stacks.

HANGING ROCK DISTRICT.—CHARCOAL.

Bellefonte Furnace, Means, Russell & Means, Ashland, Boyd county. Furnace in Greenup county. One stack, 33 x 10½; built in 1826; hot blast; open top; annual capacity, 3,000 net tons. John Russell, Manager.

Boone Furnace, Nathaniel Sands, Boone Furnace P. O., Carter county. One stack, 43 x 10, built in 1855; hot blast; open top; annual capacity, 4,500 net tons. Not in blast in 1875.

Buena Vista Furnace, Means & Co., W. W. Culbertson, Agent, Ashland, Boyd county. One stack, 40 x 10; hot blast; open top; built in 1848; yearly capacity, 5,000 net tons.

Buffalo Furnace, Culbertson, Earhart & Co., Greenupsburg, Greenup county. One stack, 40 x 10½, built in 1851; hot and cold blast; fuel, half charcoal and half wood; annual capacity, 3,000 net tons.

Charlotte Furnace, Charlotte Furnace Co., Charlotte Furnace P. O., Carter county. One stack, 50 x 11, iron shell, built in 1873; warm blast; closed top; annual capacity, 4,000 net tons. President, Matt. Ellis; Secretary and Treasurer, H. W. Bates; Manager, A. C. Van Dyke. Formerly called Iron Hills Furnace.

Kenton Furnace, Damarin & Co., Quincy, Lewis county. Office at Portsmouth, Ohio. One stack, 36 x 11, built in 1856; open top; hot blast; annual capacity, 4,000 net tons. Not in blast in 1875. *See Eagle, Hamden and Hope Furnaces, Hanging Rock region, Ohio.*

Laurel Furnace, Robert Scott & Co., Riverton, Greenup county. One stack, 39 x 11, built in 1849; open top; cold and hot blast; annual capacity, 3,000 net tons.

Mount Savage Furnace, Lexington and Carter County Mining Co., Mount Savage, Carter county. One stack, 40 x 11, built in 1848; hot blast; open top; annual capacity, 4,000 net tons. Jos. S. Woolfolk, President; H. G. Craig, Treasurer, and L. Hood, Superintendent.

Pennsylvania Furnace, Eastern Kentucky Railway Co., Riverton, Greenup county. One stack, 37 x 11; open top; hot blast; built in 1848; annual capacity, 4,000 net tons. *See Hunnewell (coke) Furnace.*

Raccoon Furnace, Raccoon Mining and Manufacturing Co., Greenupsburg, Greenup county. One stack, 35 x 10½, built in 1831; open top; cold and hot blast; annual capacity, 4,000 net tons.

Number of charcoal furnaces in Hanging Rock region: 10 stacks.

MISCELLANEOUS.—BITUMINOUS COAL AND COKE.

Kenton Furnace, Gaylord Iron and Pipe Co., Cincinnati, O. Works at Newport, Campbell county, Ky. One stack, 60 x 16, built in 1869; annual capacity, 14,000 net tons; closed top. T. G. Gaylord, President, and C. B. Foote, Secretary and Treasurer. Not in blast since January, 1873. *See Wayne Furnace, Tennessee.*

Swift's Iron and Steel Works, Cincinnati, O. Works at Newport, Ky. One stack, 65 x 16, built in 1859, enlarged in 1869; closed top; coke; annual capacity, 17,000 net tons. *See Rolling Mills.*

Number of bituminous furnaces outside of Hanging Rock region: 2 stacks.

MISCELLANEOUS.—CHARCOAL.

Bath Furnace, Bath Iron Co., Frank Fitch, President, Costigan, Bath county. One stack, 40 x 10½; cold blast; built in 1839; rebuilt in 1872-3.

Centre Furnace, D. Hillman & Sons, Empire Iron Works, Trigg county. Furnace in Lyon county. One stack, 50 x 12, built in 1852; hot and cold blast; daily capacity, 14½ net tons. *See Rolling Mills. See Trigg Furnace.*

Cottage Furnace, Cottage Furnace Co., Mount Sterling, Estill county. One stack, 38 x 10½, built in 1855; cold blast.

Estill Furnace, Red River Iron Manufacturing Co., Fitchburg, Estill county. One stack, 32 x 10; cold blast; built in 1830. E. D. Standiford, President; R. S. Veech, Secretary and Treasurer, and C. W. Russell, Manager. Not in blast in 1875. *See Red River Furnaces.*

Laura Furnace, John P. Pringle & Co., Laura Furnace, Trigg county. One stack, 36 x 9; built in 1851; cold blast; out of blast for several years; started afresh in April, 1873.

Red River Furnaces, Red River Iron Manufacturing Co., E. D. Standiford, President, Fitchburg, Estill county. Two stacks, each 50 x 14, built in 1869; cold blast; open tops. Not in blast in 1875. *See Estill Furnace.*

Trigg Furnace, D. Hillman & Sons, Trigg Furnace, Trigg county. Office at Empire Iron Works, Trigg county. One stack, 48 x 12, built in 1871; hot and cold blast; daily capacity, 18 net tons. *See Rolling Mills. See Centre Furnace.*

Number of charcoal furnaces outside of Hanging Rock region: 8 stacks.
Total number of furnaces in Kentucky: 23 stacks.

TENNESSEE.

DYESTONE REGION.—BITUMINOUS COAL AND COKE.

Chattanooga Iron Co., Chattanooga, Hamilton county. One stack, 61 x 12½; completed in 1874; blown in in September, 1874; closed top; annual capacity, 6,800 net tons. President, J. N. McLane; Secretary, J. A. Austin, and Superintendent, Edward Doud.

Oakdale Furnace, Oakdale Iron Co., Kingston, Roane county. Works at Oakdale, Roane county. One stack, 65 x 16½, built in 1873; put in blast November 11, 1873.

Rockwood Furnaces, Roane Iron Co., Rockwood, Roane county. Office at Chattanooga. Two stacks, 65 x 16, and 56 x 14, built in 1867 and 1872; total annual capacity, 24,000 net tons; closed tops. *See Rolling Mills.*

Number of bituminous furnaces in Tennessee: 4 stacks.

PROJECTED.

Tennessee Coal and Railroad Co., Tracy City, Grundy county. One stack, commenced in 1873, but never finished. E. O. Nathurst, Secretary.

EASTERN OR UNAKA REGION.—CHARCOAL.

Carter Furnace, Knoxville Carwheel Co., Knoxville. Furnace in Carter county. One stack, 32 x 8; cold blast; water-power; built in 1840. A. L. Maxwell, President, and Harvey Clark, Secretary.

Eagle Furnace, Benjamin Gallup, Bristol, Sullivan county. One stack, 33 x 8, built in 1838; cold blast; water-power.

Embreeville Furnace, Bradley & Co., Jonesboro, Washington county. One stack, 32 x 8½, built in 1846. A new fifteen-ton furnace is projected in place of this stack.

Pottsdale Furnace, New York and East Tennessee Iron Co., Greeneville, Greene county. One stack, 32 x 8½, built in 1862; cold blast; water-power; open top; annual capacity, 2,500 net tons. George Taylor, President, and F. A. Potts, Secretary and Treasurer, 110 Broadway, New York; J. A. Trim, Superintendent. Out of blast since February, 1874.

Unaka Furnace, W. F. Gleason, Unaka, Greene county. One stack, 33 x 10½; hot blast; built in 1868.

Number of charcoal furnaces in eastern region: 5 stacks,

WESTERN REGION.—CHARCOAL.

- Bear Spring Furnace, Woods, Yeatman & Co., Cumberland Iron Works, Dickson county. Office at Nashville. Furnace in Stewart county. One stack, $38 \times 11\frac{1}{2}$, built in 1832, abandoned in 1854, and rebuilt in 1873; open top; either hot or cold blast; yearly capacity, 5,000 tons. In blast in 1875. *See Dover Furnace. See Bloomaries.*
- Brownsport Furnace, Young & Walker, Brownsport Furnace, Decatur county. One stack, 40×12 , built in 1850; hot blast.
- Clark Furnace, La Grange Iron Works, Danville, Benton county. Furnace in Stewart county. One stack, 36×10 ; hot blast; built in 1854. J. C. Garrett, President. *See Eclipse and La Grange Furnaces.*
- Cumberland Furnace, J. P. Drouillard, Cumberland Furnace, Dickson county. One stack, $35 \times 10\frac{1}{2}$, built in 1825; hot blast; open top; annual capacity, 4,000 net tons.
- Dover Furnace, Woods, Yeatman & Co., Cumberland Iron Works, Dickson county. Office at Nashville. Furnace in Stewart county. One stack, $34\frac{3}{4} \times 10$; open top; cold blast; built in 1828, abandoned in 1834, rebuilt in 1854, and repaired in 1873; annual capacity, 3,600 net tons. Out of blast in 1875. *See Bear Spring Furnace.*
- Eclipse Furnace, La Grange Iron Works, Danville, Benton county. Furnace in Stewart county. One stack, $35 \times 9\frac{1}{2}$, built prior to 1855; cold blast. *See Clark Furnace.*
- La Grange Furnace, La Grange Iron Works, Danville, Benton county. Furnace in Stewart county. One stack, $35 \times 9\frac{1}{2}$; hot blast; built in 1832. *See Clark Furnace.*
- Napier Furnace, Ward, Rains & Co., Columbia, Maury county. Furnace in Lewis county. One stack, 35×9 ; cold blast; repaired in 1873.
- Rough and Ready Furnace, Rough and Ready Iron Works, Rough and Ready Furnace, Stewart county. One stack, 35×10 , built in 1850; hot blast.
- Speedwell Furnace, Woodson, Rose & Harbison, Speedwell, Claiborne county. One stack, 30×9 , built in 1825; cold blast; water-power; annual capacity, 1,000 net tons.
- Vernon Furnace, Sechler, McCullough & Co., Vernon Furnace, Montgomery county. One stack, $34 \times 10\frac{1}{2}$; hot blast; built in 1833; closed top; annual capacity, 4,000 net tons.
- Wayne Furnace, Gaylord Iron and Pipe Co., (of Cincinnati, Ohio,) G. W. Boyd, Superintendent, Wayne Furnace, Wayne county. One stack, 42×11 , built in 1856; hot blast. *See Kenton (coke) Furnace, Kentucky.*
- Worley Furnace, Orr, Newell & Co., Worley Furnace, Dickson county. One stack, 36×9 ; hot blast; built in 1847.
- Number of furnaces in Western region: 13 stacks. Total number of furnaces in Tennessee: 22 stacks.

OHIO.

HANGING ROCK.—CHARCOAL.

- Bloom Furnace, John Paull & Co., Bloom Switch, Scioto county. One stack, 33 x 11, built in 1832, and rebuilt in 1846; annual production, 3,000 net tons; hot blast; open top. Furnace building lighted at night by natural gas from an 800-foot well. For sale. F. E. Duduit, Manager, Portsmouth, Ohio.
- Buckeye Furnace, Buckeye Furnace Co., Berlin X Roads, Jackson county. One stack, 37 x 11, built in 1851; open top; hot and cold blast; annual capacity, 4,000 net tons. L. Davis, Superintendent and Agent, and T. J. Williams, Secretary.
- Buckhorn Furnace, Charcoal Iron Co., Ironton, Lawrence county. One stack, 36 x 9½, built in 1834; open top; annual production, 4,000 net tons. S. C. Johnson, President. *See Howard Furnace.*
- Cambria Furnace, David Lewis & Co., Samsonville, Jackson county. One stack, 38 x 11, built in 1854; hot blast; open top; annual capacity, 4,000 net tons. W. W. Evans, Manager.
- Centre Furnace, W. D. Kelly & Sons, Ironton, Lawrence county. One stack, 40 x 10½, built in 1837; open top; hot blast; annual capacity, 4,000 net tons. *See Grant Furnace.*
- Cincinnati Furnace, Long & Smith, Cincinnati Furnace, Vinton county. One stack, 40 x 10½, built in 1853; open top; hot blast; annual capacity, 4,000 net tons.
- Clinton Furnace, Wm. J. Bell, Wheelersburg, Scioto county. One stack, 31 x 9½, built in 1832; hot blast; open top; annual capacity, 5,020 net tons. Not in blast since October, 1873.
- Eagle Furnace, L. C. Damarin, Reed's Mills, Vinton county. Addressed at Portsmouth, Ohio. One stack, 32¾ x 11, built in 1852; open top; hot blast; annual capacity, 4,500 net tons. *See Hamden and Hope Furnaces, Ohio, and Kenton Furnace, Kentucky, (charcoal).*
- Etna Furnace, Etna Iron Works, George Willard, President, Ironton, Lawrence county. One stack, 37 x 10½, built in 1832; open top; hot and cold blast; annual capacity, 4,000 net tons. *See Vesuvius Furnace and Etna (coke) Iron Works.*
- Gallia Furnace, Norton, Campbell & Co., Portsmouth, Scioto county. Furnace in Gallia county. One stack, 36 x 10, built in 1847; open top; hot blast; annual capacity, 4,000 net tons.
- Grant Furnace, W. D. Kelly & Sons, Ironton, Lawrence county. One stack, 42 x 11, built in 1869; open top; hot blast; annual capacity, 5,000 net tons. *See Centre Furnace.*
- Hamden Furnace, Damarin & Co., Portsmouth, Scioto county. Furnace

at Reed's Mills, in Vinton county. One stack, 34 x 11, built in 1854; hot blast; open top; annual capacity, 4,000 net tons. Idle in 1875.

See Eagle and Hope Furnaces.

Hecla Furnace, Hecla Iron and Mining Co., Ironton, Lawrence county.

One stack, 36 x 10½, built in 1833; cold blast; open top; annual capacity, 3,900 net tons. Wm. Means, President.

Hope Furnace, L. C. Damarin & Co., lessees, Hope Furnace, Vinton county. One stack, 36 x 10½, built in 1854; open top; hot blast; annual capacity, 4,000 net tons. Idle in 1875. *See Eagle and Hamden Furnaces.*

Howard Furnace, Charcoal Iron Co., Ironton, Lawrence county. Furnace in Scioto county. One stack, 36 x 10½, built in 1853; open top; hot blast; annual capacity, 4,500 net tons. *See Buckhorn Furnace.*

Jackson Furnace, Estate of L. P. N. Smith, Sciotoville, Scioto county. Furnace in Jackson county. One stack, 36 x 10½, built in 1839; hot blast; open top; annual capacity, 4,500 net tons.

Jefferson Furnace, Jefferson Furnace Co., Oak Hill, Jackson county. One stack, 40 x 11½, built in 1854; open top; cold blast; annual capacity, 5,000 net tons.

Keystone Furnace, Keystone Furnace Co., Keystone Furnace, Jackson county. Addressed also at Portsmouth. One stack, 36 x 10½, built in 1849; open top; hot blast; annual capacity, 4,000 net tons.

Latrobe Furnace, Bundy & Cobb, Berlin X Roads, Jackson county. One stack, 35 x 10, built in 1854; open top; hot blast; annual capacity, 4,000 net tons.

Lawrence Furnace, Lawrence Furnace Co., Ironton, Lawrence county. One stack, 38 x 11, built in 1834; hot blast; fuel, charcoal, coke, and coal; open top; annual capacity, 4,500 net tons. A. B. Cole, President; W. H. Peters, Secretary, and George Peters, Vice-President and Manager.

Lincoln Furnace, Lincoln Furnace Co., Reed's Mills, Vinton county. Furnace in Jackson county. One stack, 37 x 10½, built in 1853; open top; hot and cold blast; annual capacity, 4,000 net tons.

Logan Furnace, Logan Furnace Co., Logan, Hocking county. One stack, 29 x 10, built in 1852; open top; hot blast; annual capacity, 3,500 net tons. S. Churchill, President, and C. H. Rippey, Secretary.

Madison Furnace, Clare, Duduit & Co., Clay, Jackson county. One stack, 37 x 9½, built in 1854; hot blast; open top; annual capacity, 3,500 net tons.

Monitor Furnace, Monitor Furnace Co., Ironton, Lawrence county. One stack, 50 x 11, built in 1868; annual production, 4,500 net tons; open top; hot blast. John Peters, President.

Monroe Furnace, Union Iron Co., Portsmouth, Scioto county. Furnace in Jackson county. One stack, 37 x 12, built in 1856; hot blast; open top; annual capacity, 5,000 net tons. John Campbell, President, and Wm. M. Bolles, Secretary. *See Washington Furnace.*

Mount Vernon Furnace, H. Campbell & Sons, Ironton, Lawrence county. One stack, 32 x 10, built in 1833; hot blast; open top; annual capacity, 4,400 net tons. Jno. W. Campbell, Manager.

Ohio Furnace, Means, Kyle & Co., Hanging Rock, Lawrence county. Furnace in Scioto county. One stack, 36 x 11½, built in 1845; open top; hot blast; annual capacity, 4,000 net tons. Thomas W. Means, President, and E. B. Willard, Secretary and Treasurer. *See Pine Grove Furnace.*

Olive Furnace, Campbell, McGugin & Co., Ironton, Lawrence county. One stack, 37 x 10½, built in 1846; hot blast; open top; annual capacity, 4,000 net tons.

Pine Grove Furnace, Means, Kyle & Co., Hanging Rock, Lawrence county. One stack, 36 x 12, built in 1829; open top; hot blast; annual capacity, 4,500 net tons. *See Ohio Furnace.*

Richland Furnace, Richland Furnace Co., Richland, Vinton county. One stack, 40 x 10½, built in 1854; open top; hot blast; annual capacity, 4,000 net tons.

Scioto Furnace, L. C. Robinson & Co., Portsmouth, Scioto county. One stack, 32 x 10½, built in 1844; open top; hot blast; annual capacity, 4,000 net tons.

Union Furnace, Brooks & Houston, Haydenville, Hocking county. One stack, 32 x 10, built in 1853; open top; hot blast; annual capacity, 3,500 net tons.

Vesuvius Furnace, Etna Iron Works, Ironton, Lawrence county. One stack, 32 x 9, built in 1833; cold blast; open top; annual capacity, 3,000 net tons. *See Etna Furnace and Etna (coke) Iron Works.*

Washington Furnace, Union Iron Co., Portsmouth, Scioto county. Furnace in Lawrence county. One stack, 35 x 11, built in 1853; hot blast; open top; annual capacity, 5,000 net tons. *See Monroe Furnace.*

Total number of charcoal furnaces in Hanging Rock region: 34 stacks.

BITUMINOUS COAL AND COKE.

Belfont Furnace, Belfont Iron Works, Ironton, Lawrence county. One stack, 66 x 16, built in 1868; closed top; annual capacity, 15,000 net tons. *See Rolling Mills.*

Etna Iron Works, Ironton. Two stacks: Alice, 86 x 18; first blown in, Sept. 13, 1875; closed top; Whitwell hot blast; Ferrie self-coking apparatus; annual capacity, 20,000 net tons. Blanche, 86 x 18, nearly finished to mate the Alice, will not be put in blast until trade revives.

Geo. Willard, President; John Ellison, Vice-President, and Geo. K. Hosford, Secretary and Treasurer. *See Etna and Vesuvius Furnaces (charcoal).*

Fulton Furnace, Globe Iron Co., Jackson, Jackson county. Office, Portsmouth. One stack, 50 x 11 $\frac{3}{4}$, built in 1868; closed top; annual capacity, 4,500 net tons. *See Globe Furnace.*

Globe Furnace, Globe Iron Co., Jackson, Jackson county. One stack, 46 $\frac{1}{2}$ x 12, built in 1872; closed top; annual capacity, 7,000 net tons. *See Fulton Furnace.*

Huron Furnace, Huron Iron Co., Jackson, Jackson county. One stack, 49 x 11 $\frac{1}{2}$, first blown in April 19, 1875; closed top; annual capacity, 5,500 net tons. Lot Davis, President; M. D. Jones, Secretary, and Miles Jones, Manager.

Ironton Furnace, Iron and Steel Co., Ironton, Lawrence county. One stack, 58 x 16, built in 1873-4; closed top; daily capacity, 50 net tons. Daniel R. Wolfe, Secretary. *See Rolling Mills.*

Milton Furnace, Milton Furnace and Coal Co., Milton, Jackson county. One stack, 50 x 12, built in 1873-4; put in blast June 6, 1874; annual capacity, 4,000 net tons; closed top. Alanson Robbins, President; J. E. Ferree, Secretary, and H. S. Willard, Manager.

Ophir Furnace, Ophir Iron Co., Jackson, Jackson county. One stack, 40 x 10, built in 1874; blown in June 15, 1874; closed top; raw coal; annual capacity, 4,000 net tons. Wm. T. Washam, President; J. H. Moore, Secretary, and Peter Hoop, Manager.

Orange Furnace, Orange Iron Co., Jackson, Jackson county. One stack, 40 x 10, built in 1864; closed top; annual capacity, 4,000 net tons. Out of blast in 1875.

Star Furnace, Star Furnace Co., Jackson, Jackson county. One stack, 50 x 11 $\frac{1}{2}$; completed August 20, 1866; fuel, raw coal, and ore, native; closed top; bell-and-hopper; annual capacity, 4,082 net tons. Isaac Brown, President; Alanson Robbins, Secretary; Thomas M. Jones, Manager, and Henry Price, Mining Engineer.

Tropic Furnace, Tropic Furnace Co., Jackson, Jackson county. One stack, 47 x 11 $\frac{1}{2}$, built in 1872-3; closed top; annual capacity, 5,500 net tons. E. T. Jones, President, and D. D. Morgan, Secretary.

Vinton Furnace, Bancroft & Rader, Vinton Station, Vinton county. One stack, 50 x 11, built in 1854; closed top; annual capacity, 6,000 net tons. Used Connellsville coke in 1874, native coke in 1875. Make their coke in Belgian ovens, and claim it is equal to Connellsville.

Wellston Twin Furnaces, Wellston Coal and Iron Co., Wellston, Jackson county. Two stacks, each 53 x 11 $\frac{1}{2}$, built in 1874-5; closed tops; total annual capacity, 12,000 net tons.

Number of bituminous furnaces in Hanging Rock region: 15 stacks.

MAHONING VALLEY.—BITUMINOUS COAL AND COKE.

- Ada Furnace, Mahoning Iron Co., Lowellville, Mahoning county. One stack, 56 x 15, built in 1845; rebuilt of iron in 1872.
- Anna Furnace, Struthers Iron Co., Struthers, Mahoning county. Telegraph address, Lowellville. One stack, 54 x 16, built in 1869; open top; use block coal; capacity, 18,000 net tons. Thos. W. Kennedy, Manager, and H. T. Stewart, Agent.
- Ashland Furnaces, Jonathan Warner, Mineral Ridge, Trumbull county. Two stacks, Ashland and Porter; one, 45 x 12, the other, 45 x 13; built in 1859 and 1860; block coal; closed tops; total annual capacity, 18,000 net tons.
- Brier Hill Furnace, Brier Hill Iron and Coal Co., Youngstown, Mahoning county. One stack, 47 x 12, built in 1846. N. Crandall, Secretary. *See Grace Furnaces.*
- Brown, Bonnell & Co., Youngstown, Mahoning county. Two stacks: Falcon, 60 x 14, built about 1850, and Phoenix, 65 x 16, built in 1854; fuel, block coal and Connellsville coke; closed tops; annual capacity, Falcon, 12,000 net tons, and Phoenix, 15,000 net tons. *See Rolling Mills.*
- Eagle Furnace, Eagle Furnace Co., Youngstown, Mahoning county. One stack, 51 x 13½, built in 1846; closed top; annual capacity, 11,500 net tons. Henry Manning, Secretary and Treasurer.
- Elizabeth Furnace, James Ward & Co., Niles, Trumbull county. One stack, 65 x 14½, built in 1859. Out of blast in 1875.
- Eva-Lily Furnace, Akron Iron Co., Akron, Summit county. One stack, 60 x 14, built in 1872; put in blast in September, 1873; closed top; annual capacity, 13,000 net tons. *See Rolling Mills.*
- Girard Furnace, Girard Iron Co., Youngstown. Furnace at Girard, Trumbull county. One stack, 58 x 15, built in 1866; closed top; fuel, raw coal and coke; annual capacity, 15,000 net tons. J. G. Butler, Jr., Manager.
- Grace Furnaces, Brier Hill Iron and Coal Co., Youngstown, Mahoning county. Two stacks, each 47 x 14, built in 1860 and 1861. *See Brier Hill Furnace.*
- Haselton Furnaces, Andrews Brothers, Haselton, Mahoning county. Two stacks, 56 x 18, and 56 x 13½, built in 1867 and 1868; combined daily capacity, 100 net tons.
- Himrod Furnace, Himrod Furnace Co., Youngstown, Mahoning county. Three stacks, 48 x 14, 70 x 18, and 48 x 13, built in 1859, 1860, and 1868; No. 1 rebuilt in 1872, and No. 2 in 1875; fuel, mainly raw coal; closed tops; annual capacity, No. 1, 10,000 net tons; No. 2, 18,000, and No. 3, 8,000. R. A. Wight, President, and Robert Kelly, Secretary, P. O. Box 157, New York; and A. B. Cornell, Treasurer and Manager, Youngstown.

Hubbard Furnaces, Andrews & Hitchcock, Youngstown, Mahoning county. Two stacks, each 60 x 16, built in 1867 and 1872; both in Trumbull county; fuel, raw coal; one open top, one closed; total annual capacity, 32,000 net tons.

Kitty Furnace, Wm. Ward & Co., Niles, Trumbull county. One stack, 55½ x 12½, built in 1870.

Warren Furnace, Wm. Richards & Sons, Warren, Trumbull county. One stack, 50 x 14, built in 1870. *See Rolling Mills.*

Number of bituminous furnaces in Mahoning region: 22 stacks.

MISCELLANEOUS.—BITUMINOUS COAL AND COKE.

Baird Iron Works, Baird, Thomas & Deshler, Gore, Hocking county. Building one stack, 44 x 12; annual capacity, 5,000 net tons; to use raw splint coal.

Bellaire Nail Works, Bellaire, Belmont county. One stack, 65 x 16, built in 1873; put in blast September 18, 1875; closed top; coke; annual capacity, 13,000 net tons. *See Rolling Mills.*

Benwood Iron Works, Wheeling, West Virginia. Furnace at Martin's Ferry, Belmont county, Ohio. One stack, 42 x 11, built in 1866. *See West Virginia Rolling Mills.*

Columbus Iron Co., Columbus, Franklin county. One stack, 60 x 13½, built in 1870; raw coal and coke; closed top; annual capacity, 10,000 net tons. R. C. Neil, President; W. Neil Dennison, Secretary, and Samuel Thomas, General Manager.

Emma Furnace, Union Iron Works Co., Cleveland, Cuyahoga county. One stack, 65 x 16, built in 1872; closed top; fuel, raw coal and coke; estimated daily production, 40 net tons. *See Rolling Mills.*

Fairfield Furnace, Tuscarawas Coal and Iron Co., Canal Dover, Tuscarawas county. One stack, 45 x 14, built in 1854; raw coal; closed top; annual capacity, 6,000 net tons. President, J. F. Card, Cleveland, Ohio; Secretary, Henry Anderman, and Manager, S. W. Croxton.

Fanny Furnace, Licking Iron Co., Newark, Licking county. One stack, 50 x 11½, built in 1874-5; blown in May 25, 1875; closed top; not run on Sundays; annual capacity, 6,500 net tons. Wm. Shields, President, and E. S. McKinlay, Secretary.

Franklin Furnace, Franklin Iron Co., Columbus, Franklin county. One stack, 62 x 17, completed in November, 1873; raw coal and coke; closed top; annual capacity, 18,000 net tons. Isaac Eberly, President, and N. Mithoff, Secretary. Out of blast since June, 1874.

Glasgow-Port-Washington Iron and Coal Co. Limited, Port Washington, Tuscarawas county. Two stacks, each 70 x 17½, built in 1873-4; one stack, the Nellie, first blown in in August, 1874; fuel, Connellsville coke; closed tops; total annual capacity, 33,000 net tons. President,

James Reid Stewart, Glasgow, Scotland; Secretary, Lawrence Hill Watson; Treasurer, William Rennie, and Manager, William B. Rennie. Graffton Furnaces, Graffton Furnace Co., Leetonia, Columbiana county.

Two stacks, 54 x 14, and 54 x 16, built in 1866 and 1872. Henry King, Secretary, 12 Smithfield st., Pittsburgh, Pennsylvania.

Jefferson Iron Works, Spaulding, Woodward & Co., Steubenville, Jefferson county. Two stacks, each 48 x 12½, built in 1862 and 1863; coke.

See Rolling Mills.

Leetonia Furnaces, Cherry Valley Iron Co., Leetonia, Columbiana county.

Two stacks, each 55 x 13, built in 1867; closed tops; Washingtonville coke and raw coal; total annual capacity, 20,000 net tons. *See Rolling Mills.*

Massillon Furnace, J. P. Burton, Massillon, Stark county. One stack, 45 x 14, built in 1854; raw coal; black band ore; annual capacity, 6,000 net tons.

Mingo Furnaces, Mingo Iron Works, Mingo Junction, Jefferson county.

Two stacks; one, 60 x 15, built in 1871; the other, 60 x 16, was first put in blast in September, 1873.

Morgan Furnace, David Morgan, Irondale, Jefferson county. One stack, 60 x 16, built in 1870; coke; closed top; annual capacity, 12,000 net tons. *See Rolling Mills.*

Newburgh Furnaces, Cleveland Rolling Mill Co., Cleveland, Cuyahoga county. Two stacks; one, 60 x 16, built in 1864; the other, 60 x 16½, built in 1872, was put in blast in October, 1872; closed tops; total annual capacity, 29,000 net tons. *See Rolling Mills.*

Proton Furnace, Cleveland Iron Co., Cleveland, Cuyahoga county. One stack, 60 x 16, built in 1869. S. A. Fuller, Secretary. *See Rolling Mills.*

Steubenville Furnace, Steubenville Furnace and Iron Co., Steubenville, Jefferson county. One stack, 60 x 16, built in 1872; native coke; closed top; annual capacity, 15,000 net tons. President, L. Raney; Vice-President, M. S. Stokely; Secretary, Wm. R. Drake; Treasurer, Wm. H. Mooney, and Manager, Joseph Bird.

Volcano Furnace, Volcano Furnace Co., Massillon, Stark county. One stack, 43 x 14, built in 1855; closed top; annual capacity, 6,000 net tons. James Lee, President; Anthony Howells, Treasurer, and Joseph Hicks, Manager.

Zanesville Furnace, Ohio Iron Co., Zanesville, Muskingum county. One stack, 62 x 15½, built in 1871; closed top; bell-and-hopper; annual capacity, 13,500 net tons. *See Rolling Mills.*

Number of bituminous coal and coke furnaces in Ohio, outside of the Hanging Rock and Mahoning Valley districts: 25 completed stacks, and 1 building.

CHARCOAL.—MISCELLANEOUS.

Antwerp Furnace, Antwerp Furnace Co., Antwerp, Paulding county. One stack, 42 x 8½, built in 1865. A. Cobb, Agent, 112 Superior st., Cleveland.

Manhattan Furnace, Sunday Creek Coal and Iron Co., Toledo, Lucas county. Furnace at Ironville, in Toledo. One stack, 40 x 9, built in 1866; warm blast; daily capacity, 14 net tons. F. O. Marsh, President, and D. L. Davies, Secretary and Treasurer.

Paulding Furnace, Paulding Furnace Co., Cecil, Paulding county. One stack, 42 x 10, built in 1865; hot blast; closed top; annual capacity, 6,000 net tons. John F. R. Evans, Manager.

Number of charcoal furnaces in Ohio, outside of Hanging Rock region: 3 stacks. Total number of furnaces in Ohio; 99 completed stacks, and 1 building.

INDIANA.

RAW BITUMINOUS BLOCK COAL.

Brazil Furnace, Yandes, Root & Garlick, Brazil, Clay county. One stack, 61 x 14, built in 1867; annual capacity, 14,000 net tons.

Greene County Iron Works Co., Worthington, Greene county. Addressed also at Indianapolis. Building one stack, 50 x 14; closed top; to use block coal; operated by steam; estimated annual capacity, 8,000 net tons. S. D. Jones, President; J. W. King, Secretary; C. N. Shaw, Treasurer, and J. P. Woodard, Vice-President and Manager.

Lafayette Furnace, Lafayette Iron Co., Brazil, Clay county. Located at Otter Creek, 2½ miles from Brazil. One stack, 45 x 10½, built in 1868; annual capacity, 10,000 net tons. B. F. Maston, Secretary.

Planet Furnace, Indianapolis Rolling Mill Co., Harmony, Clay county. Office at Indianapolis. One stack, 40 x 11½, built in 1867; closed top; annual capacity, 6,000 net tons. Not in blast since December, 1873. *See Rolling Mills.*

Runser Iron Co., Knightsville, Clay county. One stack, 16 x 4½, built in 1875, and put in blast September 6, 1875; cold blast; daily capacity, 12 net tons. Use slag from the neighboring furnaces. S. Runser, Superintendent.

Vigo Furnaces, Vigo Iron Co., Terre Haute, Vigo county. Two stacks, each 52 x 12, built in 1870 and 1872; fuel, raw coal and coke; one open top and one closed; combined annual capacity, 15,000 net tons. A. J. Crawford, Superintendent.

Western Furnaces, Western Iron Co., Knightsville, Clay county. Two stacks, each 48 x 12½; built in 1867 and 1868; total annual capacity, 15,000 net tons. *See Rolling Mills.*

Number of bituminous furnaces in Indiana: 8 completed stacks, and 1 building.

CHARCOAL.

Nelson Furnace, Nelson Furnace Co., Shoals, Martin county. One stack, 60 x 13, built in 1872; hot blast; closed top; annual capacity, 7,000 net tons. President, Nelson Fordice; Secretary, Wm. H. Dillingham; Assistant Secretary and Treasurer, Wm. H. Daniel, and Manager, Wm. H. Lampton.

Number of charcoal furnaces in Indiana: 1 stack. Total number of furnaces in Indiana: 9 completed stacks, and 1 building.

ILLINOIS.

BITUMINOUS COAL AND COKE.

Big Muddy Furnace, Wm. I. & B. W. Lewis, Grand Tower, Jackson county. Office at St. Louis, Missouri. One stack, 69 x 17, built in 1871; weekly capacity, 315 net tons.

Bridgeport Furnaces, Union Rolling Mill Co., Chicago. Two stacks, each 56 x 14, built in 1869; closed tops; fuel, Connellsville coke and Indiana coal; annual capacity, 25,000 net tons. Formerly owned by Joliet Iron and Steel Co. *See Rolling Mills.*

Grand Tower Furnaces, Grand Tower Mining, Manufacturing and Transportation Co., Grand Tower, Jackson county. Two stacks, each 68 x 16, built in 1868; open tops; fuel, 3 parts raw Big Muddy coal, and 1 part coke, made from slack of the same kind of coal; Missouri ores; No. 2 has been in blast since March, 1874; No. 1 has been partially demolished; total annual capacity, 27,000 net tons; product, Bessemer pig iron. Operated by Charles N. Talbot and Josiah O. Low, trustees for bondholders; Thomas M. Williamson, Superintendent.

Illinois Furnace, Illinois Furnace Co., Elizabethtown, Hardin county. One very old stack, 39 x 11, probably the first built in Illinois, but repaired in 1873; controlled by Indianapolis capital.

Joliet Iron and Steel Works, Joliet Iron and Steel Co., 93 Dearborn st., Chicago. Works at Joliet, Will county. Two stacks, each 72 x 20, built in 1873; coke; closed tops. Not yet in operation. *See Rolling Mills.*

Meier Iron Co., East St. Louis, St. Clair county. Office, 26 North Main st., St. Louis. Two stacks, each 60 x 17, built in 1873-5; Whitwell hot blast; closed tops; annual capacity, 40,000 net tons. Adolphus Meier, President; Edward D. Meier, Secretary, and Adolphus Meier, Jr., Treasurer.

North Chicago Rolling Mill Co., Chicago. Two stacks, each 65 x 17, built in 1869; coke; closed tops; total annual capacity, 35,000 net tons. *See Rolling Mills.*

Total number of furnaces in Illinois: 12 stacks.

MICHIGAN.

CHARCOAL.

- Bancroft Furnace, Bancroft Iron Co., Marquette, Marquette county. One stack, 40 x 9, built in 1859, and rebuilt in 1871; water-power.
- Bangor Furnace, Bangor Furnace Co., Bangor, Van Buren county. One stack, 45 x 10, built in 1872; hot blast; annual capacity, 12,000 net tons; closed top; bell-and-hopper. A. B. Hough, President, Cleveland, Ohio; C. D. Rhodes, Treasurer, Chicago, and Henry Ford, Secretary and General Manager, Bangor, Michigan. Agents, Rhodes & Bradley, 42 Dearborn st., Chicago.
- Bay Furnaces, Bay Furnace Co., Onoto, Schoolcraft county. Two stacks; one, 45 x 9, built in 1870; one, 45 x 9½, completed and put in blast in December, 1872; hot blast; total annual capacity, 20,160 net tons. F. B. Spear, President, and E. P. Williams, Secretary and Treasurer, Marquette; H. S. Pickands, Superintendent, Onoto.
- Carp River Furnace, Peninsular Iron Co., Detroit. Furnace at Marquette, Marquette county. One stack, 45 x 10, built in 1872-3; hot blast; open top; annual capacity, 6,000 net tons. John Burt, President, and Solon Burt, Secretary and Treasurer. *See Peninsular Furnace.*
- Caseville Furnace, Pigeon River Furnace and Salt Co., Caseville, Huron county. One stack, 45 x 9½, built in 1873; hot blast. Wm. McKinley, Agent.
- Deer Lake Furnaces, Deer Lake Iron and Lumber Co., Ishpeming, Marquette county. Two stacks, one, 47 x 8, built in 1868; the other, 47 x 9, was built in 1873, and put in blast in October, 1873; both hot blast; water-power; total annual capacity, 8,000 net tons. Gardiner Greene, President, Norwich, Connecticut; Theo. F. McCurdy, Secretary and Treasurer, Norwich, Connecticut, and E. R. Hall, Agent, Ishpeming, Michigan.
- Detroit and Lake Superior Iron Manufacturing Co., Detroit, Wayne county. One stone stack, 42 x 9½, built in 1857; warm blast; open top; annual capacity, 5,000 net tons. Edward C. Walker, President; Wm. H. Barnum, Vice-President, and William M. Gaylord, Secretary and Manager.
- Elk Rapids Furnace, Elk Rapids Iron Co., Elk Rapids, Antrim county. One stack, 48 x 12, built in 1873; put in blast in July, 1873; hot blast; daily capacity, 25 net tons.
- Escanaba Furnace, Empire Mining Co., Escanaba, Delta county. One stack, 51½ x 12, built in 1872-3; put in blast in February, 1873; hot blast.
- Eureka Furnace, Eureka Iron Co., Detroit. Furnace at Wyandotte,

Wayne county. One stack, 45 x 9, built in 1853; hot blast; annual capacity, 6,000 net tons. A. P. Cook, President; W. S. Armitage, Secretary, and W. H. Bronson, Treasurer.

Frankfort Furnaces, Frankfort Furnace Co., Detroit. Furnaces at South Frankfort, Benzie county. Two stacks, each 42 x 9½, built in 1870 and 1873; hot blast; open tops; annual capacity, 13,500 net tons. W. C. Colburn, President; Edward Kanter, Vice-President, and E. H. Rees, Secretary and Manager.

Iron Cliffs Co., Negaunee, Marquette county. Three stacks: Cliffs Furnace, 48 x 9½, built in 1867, and rebuilt in 1873. Pioneer Furnaces, two stacks, each 40 x 9½; one built in 1858, and the other in 1859. Total annual capacity, 18,000 net tons.

Ishpeming Furnace, Lake Superior Iron Co., Marquette. Furnace at Ishpeming. One stack, 43 x 9, built in 1872; ran for a portion of 1873 on peat and charcoal; out of blast in 1875. Joseph S. Fay, President; Richard S. Fay, Treasurer, and C. H. Hall, Agent. *See Grace Furnace.*

Jackson Furnaces, Jackson Iron Co., Fayette, Delta county. Two stacks, each 40 x 9½, built in 1867 and 1869; hot blast; open tops; total annual capacity, 22,000 net tons; product, Bessemer pig iron. These furnaces are 100 miles from the Company's mines, at Negaunee, and were built at Fayette on account of the abundance of timber. There are 48 charcoal kilns, and 6 more will be built in 1876. Fayette Brown, General Agent, Cleveland, Ohio; J. B. Kitchen, Agent, Fayette, Mich.

Lawton Iron Works, Michigan Central Iron Co., Lawton, Van Buren county. One stack, 40 x 9, built in 1867; hot blast. Henry Ford, Agent.

Menomonee Furnace, Menomonee Iron Co., Menomonee, Menomonee county. Office at 92 Washington street, Chicago. One stack, 45 x 9½; hot blast; built in 1872-3; put in blast July 18, 1873; annual capacity, 6,000 net tons. Charcoal made from pine slabs from the lumber mills is used.

Michigan Iron Co., Marquette. Furnaces at Clarksburgh, Marquette county. Two stacks: Greenwood, 42 x 9, built in 1865; and Michigan, 42 x 9, built in 1867; hot blast. A. A. Ripka, Secretary, Marquette.

Morgan Furnace, Morgan Iron Co., C. Donkersley, lessee, Marquette. Furnace at Morgan, Marquette county. One stack, 45 x 9, built in 1863; hot blast. A second stack, Champion, built in 1867, was burned in 1874, and will not be rebuilt.

Munising Furnace, Munising Iron Co., Munising, Schoolcraft county. One stack, 40 x 9, built in 1867; hot blast; closed top; water-power; annual capacity, 12,000 net tons. President, Wm. L. Wetmore, Marquette; Secretary, E. P. Williams, Marquette; Treasurer, Geo. H. Vail-

lant, Cleveland, O.; Manager, S. Brownell, Munising, Mich. Formerly Schoolcraft Furnace.

Peninsular Furnace, Peninsular Iron Co., Detroit, Wayne county. One stack, $42\frac{2}{3} \times 9\frac{1}{2}$, built in 1863; hot blast; open top; annual capacity, 6,000 net tons. *See Carp River Furnace.*

Union Iron Co., Detroit, Wayne county. One stack, $50 \times 11\frac{1}{2}$; hot blast. Austin Burt, Agent.

Wyandotte Rolling Mill Co., Detroit, Wayne county. Two stacks: one at Wyandotte, 45×11 , built in 1862; hot blast. The other at Leland, Leelenaw county, $44 \times 10\frac{1}{2}$, rebuilt in 1872; hot blast; water-power. *See Rolling Mills.*

Number of charcoal furnaces in Michigan: 30 stacks.

ANTHRACITE AND BITUMINOUS COAL AND COKE.

Grace Furnace, Lake Superior Iron Co., Marquette, Marquette county. One stack, 60×17 , built in 1872; closed top; fuel, mixed anthracite and bituminous coal; annual capacity, 15,000 net tons. *See Ishpeming (Charcoal) Furnace.*

Hamtramck Furnace, Hamtramck Iron Co., Detroit, Wayne county. One stack, 53×13 , built in 1870; open top; fuel, bituminous coal. Not in blast since 1873. E. C. Walker, President; Geo. H. Russel, Secretary and Treasurer; Geo. B. Russel, Manager, and R. S. Dillon, Superintendent.

Harvey Furnace, Northern Iron Co., Harvey, Marquette county. One stack, $50 \times 13\frac{1}{2}$, built in 1860 for charcoal; rebuilt in 1873, and altered to bituminous coal.

Rolling Mill Furnace, Marquette and Pacific Rolling Mill Co., Marquette, Marquette county. One stack, 60×15 , built in 1868; rebuilt in 1873; closed top; fuel, anthracite and bituminous coal and coke; annual capacity, 14,000 net tons. *See Rolling Mills.*

Number of anthracite and bituminous coal and coke furnaces in Michigan: 4 stacks. Total number of furnaces in Michigan: 34 stacks.

WISCONSIN.

CHARCOAL.

Appleton Iron Co., Appleton, Outagamie county. Two stacks, each $40 \times 8\frac{1}{2}$, built in 1871 and 1872; open tops; hot blast; water-power; total annual capacity, 13,500 net tons. C. Donkersley, President; A. L. Smith, Vice-President; Henry D. Smith, Secretary and Treasurer, and Elmer F. Decker, Manager.

Fond du Lac Furnace, C. J. L. Meyer, Fond du Lac, Fond du Lac county. One stack, $50 \times 10\frac{1}{2}$, built in 1873-4; not yet in blast.

Fox River Iron Co., West Depere, Brown county. Two stacks, each $40 \times 9\frac{1}{2}$; one built in 1869; the other, built in 1872, put in blast in January, 1873; hot blast; open tops; water-power; total annual capacity, 10,000 net tons. D. W. Blanchard, President and Treasurer; D. D. Kellogg, Secretary, and S. D. Arnold, Vice-President and Manager.

Green Bay Iron Co., Green Bay, Brown county. One stack, 39×9 , built in 1870; closed top; hot blast; annual capacity, 7,000 net tons. Anton Klaus, President, and G. A. Lawton, Secretary and Manager.

Iron Ridge Furnace, Wisconsin Iron Co., Iron Ridge, Dodge county. One stack, $40 \times 9\frac{1}{2}$, built in 1865; hot blast; open top; annual capacity, 4,000 net tons. O. W. Potter, President; J. J. Hagerman, Secretary; J. C. Ricketson, Treasurer and General Agent, and W. G. Sterling, Superintendent.

National Iron Co., Depere, Brown county. Two stacks; one, 45×10 , built in 1869; the other, 48×12 , built in 1872, put in blast in March, 1873; hot blast; closed tops; bell-and-hopper; combined annual capacity, 12,000 net tons. A. B. Meeker, President; W. L. Brown, Treasurer, and M. R. Hunt, Secretary and Manager.

North Western Iron Co., Mayville, Dodge county. One stack, $40 \times 9\frac{1}{2}$, built in 1853 and rebuilt in 1872; weekly production, 100 net tons.

Richland Iron Co., Cazenovia, Richland county. Building one stack, 45×9 ; hot blast; to be completed in 1876. J. M. Bean, President, Milwaukee.

Smith's Furnace, John F. Smith, Ironton, Sauk county. One stack, 30×8 , built in 1857; warm blast; open top; steam and water power; annual capacity, 2,000 net tons.

Number of charcoal furnaces in Wisconsin: 11 completed stacks, and 1 building.

HALF ANTHRACITE COAL AND HALF COKE.

Milwaukee Iron Co., Milwaukee. Works at Bay View, near Milwaukee. Two stacks, each 66×17 , built in 1870 and 1871; total annual capacity, 35,000 net tons. *See Rolling Mills.*

Minerva Iron Co., Milwaukee. One stack, 55×15 , built and put in blast in the summer of 1873; annual capacity, 15,000 net tons. H. J. Hilbert, President; T. H. Judd, Secretary; R. H. Pierce, Treasurer, and S. A. Harrison, Manager. Out of blast since the spring of 1874.

Number of anthracite coal and coke furnaces in Wisconsin: 3 stacks. Total number of furnaces in Wisconsin: 14 completed stacks, and 1 building.

MINNESOTA.

Duluth Iron Co., Duluth, St. Louis county. One stack, $45 \times 9\frac{5}{8}$; charcoal;

built in 1873-4. Recently purchased by Robinson, Rea & Co., Brenne-
man & Ward, and others, of Pittsburgh. Has never been in blast.
Number of furnaces in Minnesota: 1 stack.

MISSOURI.

BITUMINOUS COAL AND COKE.

Jupiter Iron Works, St. Louis, St. Louis county. One stack, 75 x 20, finished in 1873; has never been in operation.

Missouri Furnaces, Missouri Furnace Co., St. Louis. Two stacks, each 56 x 14, built in 1870; raw coal and coke; closed tops; total annual capacity, 22,000 net tons. Oliver B. Filley, President; Edwin C. Cushman, Vice-President; Alex. J. Leith, Secretary and Treasurer, and Chas. A. McNair, Superintendent.

South St. Louis Iron Co., 324 North Third st., St. Louis. Two stacks, 56 x 14, and 56 x 15, built in 1870 and 1872; fuel, Big Muddy raw coal and Connellsville coke; closed tops; total annual capacity, 35,000 net tons. John H. Maxon, President; Henry S. Reed, Vice-President; Joseph E. Gorman, Secretary, and Charles Howard, Manager.

Vulcan Iron Works, St. Louis. Three stacks: two, 60 x 14 and 60 x 15, built in 1869; one, 65 x 16, finished in 1872; closed tops; fuel, raw coal and coke; annual capacity, 50,000 net tons. *See Rolling Mills.*

Number of bituminous furnaces in Missouri: 8 stacks.

CHARCOAL.

Hamilton Furnace, Hamilton Iron Co., Sullivan, Franklin county. One stack, 40 x 9½, built in 1873; put in blast, October 22, 1873; open top; hot blast. J. H. Ricker, President; Samuel McConnell, Vice-President, and J. B. Folsom, Secretary and Manager.

Irondale Furnace, E. Harrison & Co., Irondale, Washington county. Office, St. Louis. One stack, 38 x 10; hot and cold blast; open top; annual capacity, 9,000 net tons.

Iron Mountain Furnaces, Iron Mountain Furnace Co., Iron Mountain, St. Francois county. Two stacks, each 38 x 9½, built in 1846 and 1854; combined daily capacity, 40 net tons. Edwin Harrison, President.

Maramec Iron Works, Wm. James, lessee, Maramec Iron Works, Phelps county. One stack, 35 x 9½, built in 1826 and rebuilt in 1851; cold blast; water-power; daily production, 15 net tons. David Carson, Superintendent. *See Bloomaries.*

Midland Furnace, Midland Blast-Furnace Co., Steelville, Crawford county. One stack, 50 x 10, built in 1874-5; blown in April 10, 1875; closed top; either cold or hot blast; annual capacity, 9,000 net tons. This furnace is peculiarly built, having neither lining nor outer wall; the stack is

wholly built of fire-brick, 22½ inches thick. E. C. Sterling, President, and Wm. H. Lee, Secretary, 701 Pine st., St. Louis; Wm. E. Rowell, Superintendent.

Moselle Furnace, J. H. Brown & Co., Moselle, Franklin county. One stack, 39 x 9½, built in 1867; warm and hot blast; open top; annual capacity, 6,000 net tons. J. C. Smith, managing partner.

Osage Furnace, J. A. Quealy, Osage Iron Works, Camden county. One stack, 38 x 9, built in 1873; hot blast; put in blast in April, 1873.

Ozark Furnace, Wm. James & Co., Ozark, Phelps county. One stack, finished in June, 1874; hot blast.

Pilot Knob Furnace, Pilot Knob Iron Co., Pilot Knob, Iron county. Office, 110 Chestnut street, St. Louis. One stack, 46 x 11½, built in 1848; daily capacity, 25 net tons. Thomas Allen, President, and John W. Boyd, Secretary and Treasurer.

Scotia Iron Furnace, Scotia Iron Works, Leasburg, Crawford county. One stack, 40 x 9½, built in 1870; hot blast; open top; annual capacity, 12,000 net tons. President and Treasurer, Robert Anderson; Vice-President, Thomas Howard; Secretary, E. R. Lackland, and Manager, Thomas J. Scott.

Number of charcoal furnaces in Missouri: 11 stacks. Total number of furnaces in Missouri: 19 stacks.

OREGON.

Oswego Furnace, Oregon Iron Co., Oswego, Clackamas county. One stack, 32 x 10, built in 1866; open top; hot blast; water-power; fuel, charcoal; annual capacity, 4,000 net tons. President, M. S. Burrell; Secretary, Ph. C. Schuyler, and Superintendent, L. B. Seeley.

Number of furnaces in Oregon: 1 charcoal stack.

UTAH TERRITORY.

Great Western Iron Co., Iron City, Iron county. One stack, 19 x 4, built in 1874; makes 5 tons, daily, of charcoal iron. John W. Young, President; James H. Hart, Secretary, and Ebenezer Hanks, Superintendent.

Ogden Iron Manufacturing Co., Ogden. Building one stack, 45 x 12, to use bituminous coal, to be run by water-power, and to have a capacity of 9,000 net tons per annum. *See Rolling Mills.*

Number of furnaces in Utah: 1 completed stack, and 1 building.

PROJECTED.

Deseret Mining Co., Salt Lake City. N. H. Felt, President; Syvert Iversen, Secretary, and Dr. J. M. Bernhisel, Treasurer.

SUMMARY.

The description of a furnace in Lycoming county, Pennsylvania, was received too late for insertion in its proper place, and is given here, viz.: Lycoming Furnace, Wm. L. Williams, lessee, Ralston, Lycoming county, Pennsylvania. One stack, 42 x 12½; first put in operation in August, 1874; fuel, anthracite coal; closed top; steam-power; annual capacity, 6,000 net tons. Out of blast in 1875, and will not be operated in 1876 if the iron trade does not improve.

This furnace makes a total of 26 stacks in the Upper Susquehanna Valley, instead of 25 stacks, as given on page 21, and it makes a total of 279 stacks in Pennsylvania, instead of 278 stacks, as given on page 30. Total number of furnaces in the United States at the close of 1875: 713 completed stacks, and 10 building.

RECENTLY ABANDONED FURNACES.

NOTE.—Some of the furnaces named in this list have been standing for many years with good machinery, and at some time may again be put in operation.

NEW HAMPSHIRE.

New Hampshire Iron Co., Franconia, Grafton county. Charcoal. Abandoned in 1865.

VERMONT.

CHARCOAL.

Brandon Iron Works, Forestdale, Rutland county.

Dorset Iron Co., East Dorset, Bennington county.

Tyson Iron Co., Plymouth, Windsor county.

NEW YORK.

Siscoe Furnace, Westport, Essex county. Anthracite.

CHARCOAL.

Cooper's Falls Furnace, Union Iron Co. (of Buffalo), De Kalb, St. Lawrence county. Built in 1864; abandoned in 1868.

Clinton Furnace, Ontario, Wayne county.

Crown Point Iron Works, J. & T. Hammond & Co., Crown Point, Essex county. Burned in 1872. Will not be rebuilt.

- Dutchess County Iron Works, N. S. Simpkins, Jr., 32 Pine street, New York. Furnace at Dover, Dutchess county. Abandoned in 1870.
Hopewell Furnace, Hopewell, East Fishkill, Dutchess county.
Myers Steel and Iron Co., Clifton, St. Lawrence county. Abandoned in 1870.
Redwood Furnace, Redwood, Jefferson county. Built in 1854; abandoned in 1865.
Rossie Iron Works, Ogdensburg, St. Lawrence county. Built in 1843; abandoned in 1868.
Wolcott Furnace, Wolcott Village, Wayne county.

NEW JERSEY.

CHARCOAL.

- Wawayanda Furnace, Wawayanda, Sussex county. The Thomas Iron Co. intend at some time to alter this stack to anthracite.
Wynockie Furnace, Wynockie, Passaic county.

PENNSYLVANIA.

ANTHRACITE.

- Shamokin Furnace, David Longenecker, Shamokin, Northumberland county. One stack; built in 1841; abandoned in 1869.

BITUMINOUS COAL AND COKE.

- Homewood Furnace, Homewood, Beaver county.
Sarah Furnace, R. Jennings & Co., Catfish, Clarion county. Has been abandoned for ten years.

CHARCOAL.

- Bald Eagle Furnace, Lyon, Shorb & Co. (of Pittsburgh), Tyrone, Blair county.
Bloomfield Furnace, C. Knap & Co. (of Roaring Spring, Blair county), Bloomfield, Bedford county.
Buffalo Furnace, Graff & Painter, Armstrong county.
Caledonia Furnace, Estate of Thaddeus Stevens, Graeffenberg, Adams county. One stack, 33 x 8, built in 1837; not in blast for several years.
Furnace in Franklin county.
Cumberland Furnace, Ahl & Bro., Dickinson, Cumberland county. Out of blast for many years; purchased in 1872 by Ahl & Bro., who intend to operate the mines in its vicinity, and perhaps fit up the furnace.
Edward Furnace, J. M. & S. H. Bell, Vineyard Mills, Huntingdon county. Built in 1835; abandoned in 1860.
Huntingdon Furnace, G. & J. H. Shoenberger, Spruce Creek, Huntingdon county. Abandoned in 1870.

Indiana Furnace, S. C. Baker, Altoona, Blair county. Furnace in Indiana county.

Lehigh Furnace, Hewitt & Balliet, Lehigh Furnace, Lehigh county. Out of blast for four years.

Margaretta Furnace, Thomas Himes, Margaretta, York county.

Mary Ann Furnace, Horatio Trexler, Long Swamp, Berks county. Out of blast since 1869.

Martha Furnace, H. McNeal, Spang's Mills, Blair county.

Mill Creek Furnace, E. A. Green & Co., Mill Creek, Huntingdon county. Out of blast since 1869.

Montebello Furnace, Fisher & Morgan, Duncannon, Perry county. One stack, 42 x 12; water-power. Has made 4,000 net tons of pig iron in a year. Abandoned for several years.

Paradise Furnace, H. Trexler, Reading, Berks county.

Pike Furnace, Hunter Orr, Lawsonham, Clarion county.

Rock Hill Furnace, Orbisonia, Huntingdon county. The Rock Hill Iron and Coal Co. own the site of this furnace, have built two bituminous coal stacks near it, and abandoned the charcoal furnace in the spring of 1873.

Sally Ann Furnace, Daniel S. Hunter, Bower's Station, Berks county.

COKE.

Enterprise Furnace, Hite's Station, Allegheny county. Built in 1871-2; torn down in 1872, and not rebuilt.

MARYLAND.

Havre Iron Co., Havre de Grace, Harford county. Anthracite.

BITUMINOUS COAL AND COKE.

Lonaconing Furnace, Lonaconing, Alleghany county.

Mount Savage Furnaces, Union Mining Co., Mount Savage, Alleghany county.

VIRGINIA.

Australia Furnace, Alleghany county. Abandoned since the close of the war.

Boyd's Furnace, Buchanan, Botetourt county. One stack; not in blast for several years.

Buena Vista Furnace, Samuel F. Jordan, Buena Vista, Rockbridge county. Burned and not rebuilt.

California Furnace, Rockbridge Alum Springs, Rockbridge county. One stack; not in blast for several years.

Catawba Furnace, Fincastle, Botetourt county. One stack; not in blast for several years.

Esteline Furnace, Esteline Furnace Co., Esteline Furnace, Augusta county. One stack, 32 x 6; not in blast for several years.

Kennedy Furnace, L. Shaw, Waynesboro, Augusta county. Abandoned for sixty years, but still found on some lists of active furnaces.

Rebecca Furnace, Tredegar Iron Co., Dibbrell Springs, Botetourt county. One stack; out of blast for several years.

Roaring Run Furnace, Junction Store, Botetourt county. One stack; not in blast for several years.

Rose Furnace, Lee county. One stack; out of blast for several years.

NORTH CAROLINA.

CHARCOAL.

Long Creek Furnace, Admiral Wilkes, High Shoals, Gaston county. One stack; daily capacity, 4 tons; has not been in blast for several years.

Maratoc Iron Works, Danbury, Stokes county. Owned by parties in Richmond, Va. Though ore is plenty, this furnace has not been in blast for ten years.

SOUTH CAROLINA.

CHARCOAL.

King's Mountain Iron Co., Yorkville, York county.

Magnetic Iron Co., Unionville, Union county.

South Carolina Manufacturing Co., Spartanburg, Spartanburg county.

Built in 1835; two stacks, each 36 x 9; not in operation for several years; recently purchased by English parties.

Swedish Iron Co., Gaffney's Station, Spartanburg county. Organized about 1840; four stacks, each 36 x 9; not in blast since 1865.

ALABAMA.

CHARCOAL.

Hale & Murdoch, Columbus, Miss. Furnace in Sanford county, Alabama. One stack; abandoned in January, 1870, having been built in 1861; cause, 25 miles from railroad. The ore found here is brown hematite, yielding from 60 to 67 per cent.

Oxford Furnace, Calhoun county. Burned during the war and not rebuilt.

Roup's Valley Furnaces, Jefferson county. Abandoned in 1865.

WEST VIRGINIA.

CHARCOAL.

Clinton Furnace, Estate of George Hardman, Clinton, Preston county.

Irondale Furnace, Preston county. Formerly Franklin Iron and Coal Co.

KENTUCKY.

CHARCOAL.

Airdrie Furnace, Muhlenberg Mining Co., Paradise, Muhlenberg county.

One stack, with machinery for two; built in 1857, but was never fairly in operation.

Amanda Furnace, Means, Russell & Means, Ashland, Boyd county.

Belmont and Nelson Iron Co., Levi Brady, Manager, Belmont Furnace, Bullitt county. One stack, 36 x 9; daily capacity, 12 tons; not in blast since 1870.

Caroline Furnace, Norton Iron Works, Ashland, Boyd county.

Clinton Furnace, Means, Russell & Means, Ashland, Boyd county.

Mammoth Furnace, Morris, Machen & Co., Eddyville, Lyon county.

One stack, 31 x 9, built in 1845; daily capacity, 16 tons; not in blast for several years.

Nelson Furnace, Belmont and Nelson Iron Co., Nelson Furnace, Nelson county. One stack, 32 x 9; daily capacity, 11 tons; not in blast since 1871.

New Hampshire Furnace, S. Leaton's Estate, Quincy, Lewis county.

Oakland Furnace, Boyd county.

Steam Furnace, Norton Iron Works, Ashland, Boyd county.

TENNESSEE.

Great Western Furnace, Dover, Stewart county. Old furnace; recently sold to new parties, with a slight probability that it may be repaired and started up.

OHIO.

CHARCOAL.

Diamond Furnace, Jackson, Jackson county.

Empire Furnace, James Forsythe & Co., Franklin Furnace, Scioto county.

Franklin Furnace, O. B. Gould, Franklin Furnace, Scioto county.

Harrison Furnace, Harrison Furnace Co., Sciotoville, Scioto county.

Hocking Furnace, Hocking county.

Junior Furnace, O. B. Gould, Franklin Furnace, Scioto county.

La Grange Furnace, Means, Kyle & Co., Hanging Rock, Lawrence county.

Limestone Furnace, Portsmouth, Scioto county.

Oak Ridge Furnace, Bank of Ashland, Ironton, Lawrence county.

Pioneer Furnace, Rogers & Swop, Hale's Creek, Scioto county.

Sandy Furnace, Means & Patton, Hanging Rock, Lawrence county.

Zaleski Furnace, Zaleski Furnace Co., Zaleski, Vinton county.

Zanesville Furnace, Ohio Iron Co., Zanesville, Muskingum county.

MICHIGAN.

Collins Furnace, Collins Iron Co., Marquette, Marquette county. Built in 1858; one of the oldest furnaces in the Lake Superior region; abandoned in 1873; cause, failure of the supply of charcoal. This furnace has made 40,000 tons of pig iron in all.

ROLLING MILLS.

MAINE.

Pembroke Iron Works, Pembroke Iron Co., Pembroke, Washington county. Agents, Wm. E. Coffin & Co., Boston. Built prior to 1854; 9 double puddling furnaces, 1 single and 3 double heating furnaces, 30 nail machines, and 4 trains of rolls (one 8, one 14, and two 16-inch); steam and water power; product, bars, bands, nails, and skelp iron; annual capacity, 10,000 net tons; average make, 7,000 tons. *See Franconia Iron and Steel Works, Massachusetts.*

Portland Rolling Mill, Portland Rolling Mill Co., Portland. Built in 1866; 4 double puddling furnaces, 8 heating furnaces, and two trains of rolls; product, rails and bar iron; annual capacity, 15,000 net tons. George E. B. Jackson, Treasurer.

Number of mills in Maine: 2, one of which rolls rails.

NEW HAMPSHIRE.

Nashua Iron and Steel Co., Nashua, Hillsboro' county. M. A. Herrick, Treasurer, Boston, Mass. Built in 1848; steel-tire mill added in 1868; 19 heating furnaces, 1 Siemens open-hearth steel furnace, 4 trains of rolls, and 11 hammers; machine shop built in 1863, and rebuilt and enlarged in 1872, for manufacturing rolling mill and steam machinery; product, steel and iron forgings for railroads and machine shops, homogeneous steel and iron plate, steel plates, and steel locomotive and car tires, bar steel and bar iron.

Number of mills in New Hampshire: 1.

VERMONT.

St. Albans Iron and Steel Works, St. Albans Iron and Steel Co., St. Albans, Franklin county. Put in operation May 10, 1873; 2 double and 6 single puddling furnaces, 8 heating furnaces, 1 hammer, and 2 trains

of rolls (one 19 and one 21-inch); product, silicon-steel-top rails re-rolled, and new iron rails; annual capacity, 20,000 net tons; average make, 10,000 tons. Philo Remington, President; Geo. G. Smith, Secretary, and A. J. Gustin, Superintendent.

Number of mills in Vermont: 1 rail mill.

MASSACHUSETTS.

Bay State Iron Works, Bay State Iron Co., Boston, Suffolk county. Rail and puddle mill built in 1847; 16 double puddling furnaces, 13 heating furnaces, and 4 trains of rolls. No. 1 plate mill built in 1863; 2 trains of rolls, 5 heating furnaces, and one hammer. No. 2 plate mill built in 1873, first put in operation January 1, 1874; 6 heating furnaces, 1 Siemens open-hearth steel furnace, and 4 trains of rolls; product, rails, homogeneous steel plates, and flange, boiler, and tank plates; annual capacity, rails, 22,000 net tons; plates, mill No. 1, 4,500 tons, and No. 2, 6,000 tons. John H. Reed, Treasurer, and J. Avery Richards, Assistant Treasurer. *See New York Furnaces.*

Boston Rolling Mills, 17 Batterymarch street, Boston. Works in Cambridgeport. Built in 1868; 5 heating furnaces, 1 horse-shoe machine, and 3 trains of rolls; product, rerolled Norway and Swedish shapes, bolt, nail, rivet, and wire rods, scrap wire and rivet rods, scrap rods, scrolls, tires, horse-shoe iron, and hand and machine made horse-shoes. W. R. Ellis, Treasurer.

Bridgewater Iron Co., Bridgewater, Plymouth county. Built in 1785 and 1874; 5 scrap furnaces, 3 heating furnaces, 6 forge fires, 8 trains of rolls, and 10 hammers; product, bar iron and tack plate, sheet zinc and sheet copper, and miscellaneous iron and steel forgings; use scrap iron and scrap steel exclusively; product of rolled iron, about 3,000 net tons yearly. Nahum Stetson, Treasurer.

Danvers Rolling Mill, Danvers, Essex county. Built in 1831; product, shapes and rods; annual capacity, 2,500 net tons.

East Bridgewater Iron Co., Rogers & Sheldon, Boston. Works at East Bridgewater, Plymouth county. Built in 1837; 2 single puddling furnaces, 4 heating furnaces, 1 train of rolls, 26 nail machines, and 1 hammer; water-power; product, cut nails, clinch nails, tack and shovel plate, and charcoal blooms; annual capacity, 2,500 net tons; average yearly production, 2,200 tons.

Fall River Iron Works, Fall River Iron Works Co., Fall River, Bristol county. Built in 1822; 3 buildings: rolling mill, nail mill, and foundry; 5 double and 2 single puddling furnaces, 18 heating furnaces, 105 nail machines, 1 hammer, and 8 trains of rolls (two 8, two 9, and four 18-inch); product, nails, hoops, bands, and merchant bar iron to 2 inches

wide; annual capacity, 11,000 net tons; average yearly production for past two years, 7,000 tons.

Franconia Iron and Steel Works, Wareham, Plymouth county. Owned by Wm. E. Coffin & Co., Boston. Built in 1866; 1 single and 5 double puddling furnaces, 4 heating furnaces, and 3 trains of rolls (one 8, one 18, and one 16-inch); product, bar iron, all kinds and sizes. *See Pembroke Iron Works, Maine.*

Gosnold Mills, New Bedford, Bristol county. Built in 1857; 7 heating furnaces, and 5 trains of rolls; product, hoops, bands, scrolls, tires, rods, and horse-shoe and hame iron; annual capacity, single turn, 4,500 net tons; average yearly production, single turn, 3,500 tons. Owned and operated by a stock company; Joseph H. Cornell, President; George Wilson, Treasurer; John A. Bates, Secretary, and Henry Howard, Superintendent.

Kinsley Iron and Machine Works, Kinsley Iron and Machine Co., Canton, Norfolk county. Built in 1788, and incorporated in 1855; burned down January 14, 1875, and rebuilt, enlarged, and put in operation by May 24, 1875; 1 single and 4 double puddling and 6 heating furnaces, and 3 trains of rolls (one 8, one 14, and one 18-inch), 1 busheling and 2 scrap furnaces, and 8 hammers; steam and water power; product, bar iron, shapes, tack and shovel plate, and railroad supplies; annual capacity, 10,000 net tons. Oliver Ames, President; Edw. R. Eager, Treasurer, and Frank M. Ames, Agent.

Mount Hope Iron Works, Somerset, Bristol county. Built in 1875; 1 single and 3 double puddling furnaces, 5 heating furnaces, 65 nail machines, and 2 18-inch trains of rolls; product, nails, tack plate, skelp iron, shovel plate, etc.; annual capacity, 4,500 net tons. J. M. Leonard, Treasurer.

Newton Iron Works, Frederick Barden, lessee, Newton Upper Falls, Middlesex county. Built about 1800; 2 heating furnaces and 1 train of rolls; water-power; product, horse-nail rods, and shapes for machinery and gun barrels; annual capacity, 2,500 net tons; average annual production, 1,500 tons.

Norway Iron Works, Naylor & Co., Boston. Office, 8 Oliver street. Built in 1854; 12 single puddling furnaces, 11 heating furnaces, 8 trains of rolls, 1 Siemens open-hearth steel furnace, and 3 hammers; product, round and square iron, and steel springs, tires, toe calks, and sleigh shoes; annual capacity, 15,000 net tons; average annual production, 11,000 tons.

Old Colony Iron Co., Taunton, Bristol county. Built in 1825; 5 double and 6 single puddling furnaces, 9 heating furnaces, 95 nail machines, 5 trains of rolls, and 5 hammers; steam and water power; product, nails, tack plates, and shovels.

Parker Mills, Wareham, Plymouth county. Built in 1815; 6 double puddling furnaces, 2 heating furnaces, 75 nail machines, 2 trains of rolls, and 1 hammer; water-power; product, nails.

Robinson Iron Co., Plymouth, Plymouth county. Built about 1800; therefore one of the oldest nail mills in the United States; purchased by present owners from N. Russell & Co., in 1865; 1 double puddling furnace, 6 heating furnaces, 2 trains of rolls, 17 nail machines, and 1 squeezer; steam and water power; product, nails and tacks; average yearly production, 3,000 net tons.

Somerset Iron Co., Somerset, Bristol county. Built in 1855; 7 double puddling furnaces, 6 heating furnaces, 68 nail machines, 1 hammer, and 3 trains of rolls (1 tack and two 18-inch trains); product, nails, shovel plate, nail machines, shears, castings, mill machinery, hoisting engines, etc.; annual capacity of rolled iron, 5,000 net tons. Formerly Mount Hope Iron Works. O. A. Washburn, Jr., Treasurer.

Tisdale Nail Works, Tisdale Nail Co., East Wareham, Plymouth county. Built in 1836; 5 double puddling furnaces, 7 heating furnaces, 3 trains of rolls, and 70 nail machines; water-power; product, bar iron and nails; annual capacity, 70,000 kegs of nails. This includes Glen Rolling Mill, belonging to the same property, situated $2\frac{1}{2}$ miles from the Tisdale Works. The establishment is now in the hands of executors, has been standing for some time, and is offered for sale.

Tremont Nail Works, Tremont Nail Co., West Wareham, Plymouth county. Built about 1820; 1 single and 6 double puddling furnaces, 6 heating furnaces, 4 trains of rolls, and 75 nail machines; steam and water power; product, nails, and small rounds and squares; annual capacity, 6,000 net tons. Horace P. Tobey, Treasurer.

Wareham Nail Co., South Wareham, Plymouth county. Built in 1836; 1 double puddling furnace, 3 heating furnaces, 32 nail machines, and 2 trains of rolls; steam and water power; product, nails; annual capacity, 2,500 net tons; average yearly production, 2,000 tons.

Washburn and Moen Manufacturing Co., Worcester, Worcester county. Two mills: Quinsigamond Rolling Mill; built in 1846; 5 heating furnaces and 2 trains of rolls; product, iron and steel screw, rivet, and wire rods; annual capacity, 5,000 net tons; average yearly production, 4,000 tons. Grove Mill; built in 1868; 1 heating furnace and 1 train of rolls; product, patent continuous wire rods of long lengths and small size for telegraph and rope wire; annual capacity, 10,000 net tons; average yearly production, 4,000 tons. Philip L. Moen, President and Treasurer; Chas. F. Washburn, Secretary, and Chas. H. Morgan, Superintendent.

Washburn Iron Co., Worcester. Built in 1857; 1 single and 3 double puddling furnaces, 9 heating furnaces, 2 hammers, and 2 trains of rolls

(one 3-high, 18-inch rail train, and one 2-high, 20-inch roughing train); product, rerolled rails; annual capacity, 18,000 net tons; average yearly production, 13,500 tons. Edward L. Davis, Treasurer, and Geo. W. Gill, Manager.

Weymouth Iron Co., East Weymouth, Norfolk county. Built in 1836; 6 double puddling furnaces, 5 heating furnaces, 82 nail machines, and 3 trains of rolls; steam and water power; product, nails and spikes; annual capacity, 5,600 net tons; average yearly production, 4,500 net tons.

Isaac Pratt, Jr., President, and Nahum Stetson, Treasurer and Manager.

Number of mills in Massachusetts: 22; 2 of which make rails.

RHODE ISLAND.

Providence Iron Co., Providence. Built in 1845; 6 double puddling furnaces, 7 heating furnaces, 6 trains of rolls, 68 nail machines, and 2 squeezers; product, nails and wire rods; annual capacity, 7,200 net tons; average yearly production, 6,500 tons.

Rhode Island Horse Shoe Works, Rhode Island Horse Shoe Co., Providence. Works at Valley Falls, 7 miles from Providence. Built in 1857 and 1874; 6 scrap and 4 heating furnaces, 6 trains of rolls, and 16 horse-shoe machines; product, bars for the horse-shoe machines; annual capacity 10,000 net tons, single turn. F. W. Carpenter, President and Manager.

Number of mills in Rhode Island: 2.

CONNECTICUT.

Aetna Nut Co., Southington, Hartford Co. Built in 1873; 1 single puddling furnace, 3 scrap and 2 heating furnaces, and 3 trains of rolls (one 8, one 10, and one 18-inch); product, squares, rounds, nut shapes, bolt rods, and butt iron; annual capacity, 5,500 net tons; average make, 2,800 tons.

Cold Spring Iron Works, Mitchell Bros. & Co., Norwich, New London county. Built in 1845; 3 heating furnaces and 2 trains of rolls; product, rods and bands; annual capacity, 1,700 net tons.

Greenwich Iron Works, Ayres & Davenport, Stamford, Fairfield county. Built in 1836; 2 single puddling furnaces, 2 heating furnaces, and 3 trains of rolls; water-power; product, round and square rods, $\frac{1}{4}$ to $\frac{5}{8}$; annual capacity, 2,000 net tons; average yearly production, 800 tons.

Iron and Steel Works, Derby, New Haven county. Built in 1843; 2 busheling furnaces, 1 single puddling furnace, 5 heating furnaces, 5 trains of rolls and 5 hammers; steam and water power; product, carriage springs, axles, all sizes merchant bar iron, and wire rods; annual capacity, 7,000 net tons bars, 1,500 tons axles, and 800 tons springs; average annual production, 2,000 net tons bar iron and wire rods, 564

tons axles, and 168 tons springs. Charles Atwater, President; Thomas Elhnes, Secretary, and W. S. Charnley, Treasurer.

New Haven Rolling Mill, New Haven Rolling Mill Co., New Haven. Completed in August, 1871; 5 heating furnaces and 2 trains of rolls (one 8 and one 18-inch); product, bar iron, small rounds and flats, and horse-shoe iron; annual capacity, 2,200 net tons; average yearly production, 1,900 tons; use only scrap iron. Charles Atwater, President; E. S. Wheeler, Secretary; Pierce N. Welsh, Treasurer, and Geo. W. Lester, Manager.

Stillwater Rolling Mill, Davenport & Ayres, Stamford, Fairfield county. Built in 1835; 1 single puddling furnace, 2 heating furnaces, and 3 trains of rolls; steam and water power; product, round and square rods, $\frac{1}{4}$ to $\frac{5}{8}$; annual capacity, 2,000 net tons; average yearly production, 1,400 tons.

Thames Iron Works, Norwich, New London county. Built in 1863; 3 double puddling furnaces, 1 single puddling furnace, 1 heating furnace, 2 trains of rolls, and 1 squeezer; product, merchant bar; annual capacity, 2,500 net tons; average yearly production, 2,000 tons. T. Raymond, President, and James Greenwood, Secretary.

Number of mills in Connecticut: 7.

NEW YORK.

Albany and Rensselaer Iron and Steel Co., Troy, Rensselaer county. Comprises two establishments which were consolidated in 1875: Albany Iron Works; built prior to 1854; 2 double and 32 single puddling furnaces, 13 heating furnaces, 8 trains of rolls, 45 nail machines, and 3 hammers; steam and water power; product, bars, angles, car axles, bands, railroad and boat spikes, fish plates, bolts and nuts, cut nails, and boiler rivets; annual capacity, 20,000 net tons; average yearly production, 17,500 tons. Rensselaer Iron Works; two-high rail mill built in 1846; new three-high rail mill and merchant mill built in 1866 and 1867; 18 puddling furnaces, 18 heating furnaces, and 7 trains of rolls; product, rails, bar iron and Bessemer steel; average product of puddle bars, tops and bottoms, and billets, 16,500 net tons per annum; annual capacity of rail mill, 45,000 tons; average yearly product, 35,000 tons; capacity of merchant mill, 10,000 tons; product, 6,800 tons. Bessemer steel works built in 1864; 2 five-ton converters, with 3 cupolas and spiegel furnace; annual capacity, 45,000 tons steel ingots; blooming department contains 5 heating furnaces, and an adjustable train of 30-inch rolls; capacity to roll full product of converting department; steam-power with auxiliary water-wheel. Erastus Corning, President; Chester Griswold, Vice-President; Selden Marvin, Secre-

tary and Treasurer; James E. Walker, General Manager, and Robert W. Hunt, General Superintendent. *See Furnaces.*

Auburn Iron Works, Tuttle, Reed & Dennison, Auburn, Cayuga county. Built in 1853; 1 heating furnace, 1 nine-inch train of rolls, and 1 Kirk steam hammer; use scrap iron only; product, merchant bar of all sizes and shapes; annual capacity, 1,800 net tons; average production, 1,450 tons.

Buffalo Iron and Nail Works, Pratt & Co., Buffalo, Erie county. Built in 1847; destroyed by fire and rebuilt in 1865; 25 single puddling furnaces, 8 heating furnaces, 40 nail and spike machines, 8 trains of rolls, and 1 hammer; product, bar, angle, and plate iron, cut nails, boat and railroad spikes, rivets, and street rails. *See Furnaces.*

Burden Iron Works, H. Burden & Sons, Troy. Built in 1813; 9 double and 40 single puddling furnaces, 13 heating furnaces, and 13 trains of rolls; steam and water power; product, bar and other merchant iron, horse shoes, boiler rivets, and railroad spikes; annual capacity, 42,000 net tons; average yearly production, 35,000 tons. *See Furnaces.*

Cohoes Rolling Mill, Morrison, Colwell & Page, Cohoes, Albany county. Offices, 259 River st., Troy, and at the works. Built in 1864; 6 double puddling furnaces, 1 scrap and 4 heating furnaces, and 3 trains of rolls; water-power; product, band and bar iron, and patent punched axe polls; specialty, high grade iron for edge tools and butt hinges; annual capacity, 5,000 net tons.

Delano Iron Works, Delano Iron Co., Syracuse, Onondaga county. Built in 1865; 5 double puddling furnaces, 9 heating furnaces, and 3 trains of rolls (one 9 and two 19-inch); product, rails, fish plates, railroad spikes, and merchant iron; annual capacity, rails, 16,000 net tons, merchant iron, 4,000 tons. Irving T. Ballard, Secretary.

Elmira Iron and Steel Rolling Mills, Elmira Iron and Steel Rolling Mill Co., Elmira, Chemung county. Built in 1860; 12 double puddling furnaces, 9 heating furnaces, 2 trains of rolls, 1 hammer and 1 rotary squeezer. Bar mill added in 1865; 2 single puddling furnaces, 6 heating furnaces, 1 scrap furnace, 1 hammer, and 5 trains of rolls. Product, silicon steel rails and merchant bar iron; annual production of rails, 18,000 net tons; annual product of bar mill, 8,000 tons. Dr. Edwin Eldredge, President, and H. W. Rathbun, Secretary and Treasurer. *See Furnaces.*

Hudson River Rolling Mill, Hudson River Iron Co., Poughkeepsie. Built in 1873; 6 single puddling furnaces, 4 heating furnaces, and 3 trains of rolls; product, railroad spikes, fish bolts, fish bars, railroad chairs, merchant iron and axles; annual capacity, 8,000 net tons. Richard P. Bruff, President, 63 Broadway, New York; Edwin Mar-

shall, Secretary and Treasurer, Poughkeepsie; and John McAnerney & Co., General Agents, 63 Broadway, New York.

Keeseville Rolling Mill, Ausable Horse Nail Co., Keeseville, Clinton county. Built in 1869; 2 heating furnaces, 1 train of rolls, and 1 hammer; water-power; product, nail rods only; annual capacity, 2,000 net tons; average yearly production, 1,200 tons. The nail rods are all worked into horse nails by the same Company. E. Kingsland, President; N. Kingsland, Vice-President; J. R. Romeyn and Abraham Bussing, Secretaries, and E. K. Baber, Treasurer.

Lake Champlain Iron Works, owned by State of New York, State Prison, Dannemora, Clinton county. Built in 1853; 48 nail machines, and 1 train of rolls; product, cut nails, bar iron, marble saws, and horse shoes. G. Moffitt, Agent. *See Forges.*

Lockport Hoop and Band Iron Works, Lockport, Niagara county. Built in 1870; 2 puddling and 2 heating furnaces and 2 trains of rolls; water-power; product, hoops, bands, horse-shoe iron, rounds and squares; annual capacity, 3,600 net tons. B. H. Fletcher, President, and C. B. Gay, Secretary.

Peru Steel and Iron Co., 245 Pearl st., New York. Works at Clintonville, Clinton county. Built in 1824; 4 heating furnaces and 3 trains of rolls; water-power; product, bar iron; annual capacity, 4,500 net tons. Charles Bliven, President; F. J. Dominick, Vice-President, and Edward Dodge, Treasurer. *See Forges.*

Rogers (J. & J.) Iron Co., Ausable Forks, Essex county, and Black Brook, Clinton county. Built in 1834; 22 forge and blooming fires, 3 heating furnaces, 2 trains of rolls, and five 5-ton hammers; steam and water power; product, charcoal blooms and all sizes of merchant bar iron; annual capacity, 7,800 net tons; average yearly production, 6,000 tons. Nail mill burned in December, 1874. James Rogers, President, and John Rogers, Vice-President. *See Forges.*

Rome Iron Works, Rome Iron Co., Rome. Built in 1866; 7 double puddling and 8 heating furnaces, 2 trains of puddle rolls (one 18 and one 20-inch), and 1 rail train; product, rails.

Rome Merchant Iron Mill, Rome Merchant Iron Co., Rome. Built in 1869; 1 double and 4 single puddling furnaces, 3 heating furnaces, 1 hammer and 2 trains of rolls (one 9 and one 18-inch); product, merchant iron; annual capacity, 5,000 net tons; average yearly production, 3,500 tons. E. B. Armstrong, President; J. B. Jervis, Secretary; A. R. Rand, Treasurer, and John Groves, Superintendent.

Samson Dale Iron Works, John Peck, Haverstraw, Rockland county. Built in 1832; 4 single puddling furnaces, 5 heating furnaces, and 4 trains of rolls (one 8 and one 16-inch bar, and one 16 and one 20-inch

sheet) ; steam and water power ; product, rods, bars, and sheet iron ; annual capacity, 3,000 net tons ; average make, 1,000 tons.

Skaneateles Iron Works, James Bates, Skaneateles Falls, Onondaga county. Built in 1868 ; 2 double puddling furnaces, 2 heating furnaces, and 2 trains of rolls (one 9 and one 16-inch) ; water-power ; product, bars only ; annual capacity, 2,500 net tons ; average make, 1,500 tons.

Spuyten Duyvil Rolling Mill, Spuyten Duyvil Rolling Mill Co., Spuyten Duyvil, Westchester county. Rail mill built in 1863 ; 10 heating furnaces and 2 trains of rolls. Bar mill added in 1872 ; 4 double puddling furnaces, 4 heating furnaces, and 2 trains of rolls. Product, rails, fish-plates, with bolts and nuts complete, railroad and dock spikes, rivets, and all sizes of merchant and guide mill iron ; annual capacity, 20,000 net tons.

Suffern, James, Suffern P. O., Rockland county. Built in 1850 ; product, bars. Not running in 1874 and 1875.

Syracuse Iron Works, Syracuse. Built in 1861 ; 1 single and 4 double puddling, and 5 heating furnaces, Hall's tilting and revolving mechanical puddler, 3 trains of rolls (one 6, one 9, and one 16-inch), and 2 steam hammers ; product, bar, wire rod, band, and hoop iron, railroad and boat spikes, fish bolts, and horse-shoe and bridge iron ; annual capacity, 6,000 net tons ; average yearly production, 4,000 tons. R. N. Gere, President, and Charles E. Hubball, Secretary and Treasurer.

Troy Wire Manufacturing Co., Howell, Iler, Probert & Co., Troy. Built in 1874 ; 1 heating furnace, one 6-inch train of rolls, and 6 wire-drawing blocks ; water-power ; product, wire from No. 0 to 36, small ovals, half ovals, rounds, etc., and $\frac{5}{8}$ to one-inch hoop iron ; annual capacity, 1,000 net tons.

Ulster Iron Works, Tuckerman, Mulligan & Co., Saugerties, Ulster county. Built in 1827 ; 1 single and 8 double puddling furnaces, 4 heating furnaces, 6 trains of rolls, and 1 hammer ; water-power ; product, bar, rod, and hoop iron ; annual capacity, 6,700 net tons ; average yearly production, for the past 30 years, 5,438 tons.

Union Iron Works, Union Iron Co., Buffalo, Erie county. Built in 1862, and enlarged in 1864, 1865, and 1874 ; 16 double puddling furnaces, 18 heating furnaces, and 6 trains of rolls (one 8, one 12, one 19, two 21, and one 31-inch), all 3-high ; the 8 and 12-inch are for merchant bar, the 21-inch for beams, channels, large angles, and flats, and the others are for rails, except the 19-inch, which is for puddle bar. The plate mill, 90 feet by 160 feet, contains one set roughing rolls, 2-high, 31 in. by 96 in., and one set 3-high finishing rolls, 31 in. x 96 in. ; weight of each roll, 24,000 lbs. : total weight of train, 170 tons. Engine, 36-in. cylinder, 7 $\frac{1}{2}$ -foot stroke ; weight of fly-wheel, 54 tons. Product, rails,

beams, channels, angles, shafting, bars, and plates; annual capacity, 35,000 net tons. A. Pardee, President; G. R. Wilson, Vice-President; George Beals, Treasurer; T. Guilford Smith, Secretary, and James Jenkins, Superintendent. *See Furnaces.*

Number of mills in New York: 23. Of these, 7 roll rails, one making street rails only.

NEW JERSEY.

American Sheet Iron Works, McClees & Co., Phillipsburg, Warren county. Office, 51 Little 12th street, New York. Built in 1867, and enlarged in 1870 and 1873; 2 double puddling furnaces, 1 heating furnace, 2 annealing furnaces, 1 refinery, 3 charcoal forge fires, 4 trains of 22-inch rolls, and 1 hammer; product, best American R. G. black and best bloom galvanized sheet iron, made from charcoal blooms forged at the Works; sheets are now galvanized in New York City, but arrangements are being completed to galvanize them here; annual capacity, 2,000 net tons. *See Bloomaries.*

Bergen Iron Works, Jas. H. Holdune, Jersey City. Built in 1852; 3 heating furnaces, 1 train of rolls, and 1 hammer; product, blooms and boiler plates; annual capacity, 2,000 net tons; average yearly production, 1,500 tons. Not in operation in 1875.

Boonton Iron Works, Fuller, Lord & Co., Boonton, Morris county. Built in 1825; 12 double puddling furnaces, 11 heating furnaces, 6 trains of rolls, and 150 nail machines; steam and water power; product, nails, spikes, nuts and washers; annual capacity, 300,000 kegs of nails. *See Furnaces.*

Camden Rolling Mill, Camden, Camden county. 7 double puddling furnaces, 4 heating furnaces, 40 nail machines, and 3 trains of rolls; product, bar iron and cut nails; annual capacity, 12,000 net tons of bar iron, and 75,000 kegs of nails. Not in operation since 1873. These works are offered for sale. Wm. M. Seyfert, Agent, 631 Chestnut street, Philadelphia.

Collier's Iron Works, William Collier, Paterson, Passaic county. Built in 1872; 2 heating furnaces, one 10-inch train of rolls, 2 spike machines, 1 bolt machine, and 1 hammer; product, merchant bar and horse-shoe iron, from $\frac{1}{2}$ -inch round and square to $1\frac{1}{2}$ -inch; annual capacity, 2,000 net tons. Not in operation in 1875.

Cumberland Nail and Iron Co., Bridgeton, Cumberland county. Branch office, 43 North Water street, Philadelphia. Built in 1814; 10 double puddling furnaces, 4 heating furnaces, two 18-inch trains of rolls, and 84 nail machines; steam and water power; product, nails and gas tube; annual capacity, 10,000 net tons; average annual production, 7,600 tons.

Robert S. Buck, President, Bridgeton, N. J.; William Stokes, Vice-President and Treasurer, Phila.; Nathan Beckley, Secretary, Phila., and R. J. and C. J. Buck, Managers, Bridgeton, N. J.

Delaware Rolling Mill, Delaware Rolling Mill Co., Phillipsburg, Warren county. One single and 3 double puddling furnaces, 2 heating furnaces, 2 trains of rolls (one 9 and one 16-inch), and 3 hammers; product, bar and guide iron, wagon and carriage axles; annual capacity, 3,500 net tons merchant iron; average yearly production, 3,000 tons.

Dover Rolling Mill, Dover Rolling Mill Co., Dover, Morris county. Built about 1770; 1 double and 3 single puddling furnaces, 2 heating furnaces, and 3 trains of rolls (one 8, one 12, and one 18-inch); water-power; product, puddled bar, merchant bar, spikes, bolts and rivets, and horse-shoe iron; annual capacity, 2,800 net tons merchant bar. John E. Wynkoop, President; E. S. Silliman, Treasurer, and I. B. O'Connor, Secretary.

Elizabeth Iron Works, E. G. Brown, Elizabeth, Union county. Four heating furnaces, and 2 trains of rolls (one 9 and one 16-inch); product, bar and angle iron; annual capacity, 5,000 net tons; average make, 4,000 tons. Not in operation in 1875.

Lewis Iron and Steel Co., Rockaway, Morris county. Office, 12 Cliff st., New York. A. C. Lewis, Manager. Built in 1826, and rebuilt in 1875; 8 double and 2 single puddling furnaces, 5 heating furnaces, 3 hammers, and 3 trains of rolls (one 9, one 14, and one 18-inch), and 12 steel-melting holes; steam and water-power; product, best bar iron and cast steel; annual capacity, 10,000 net tons. Formerly known as Rockaway Merchant Mill.

New Jersey Steel and Iron Co., Cooper, Hewitt & Co., 17 Burling Slip, New York. Works at Trenton, Mercer county. Built in 1845; 14 double puddling furnaces, 13 heating furnaces, 7 trains of rolls, 1 open-hearth Martin steel furnace, and 2 hammers; steam and water power; product, iron and steel-headed rails, beams, channels, angles, merchant bars, shapes, horse-shoes, and Martin steel; also, chains of all sizes; annual capacity, 25,000 net tons; average yearly production, 22,500 tons. Edward Cooper, President, and Edwin F. Bedell, Secretary, New York. Frederick J. Slade, Treasurer, and Joseph Stokes, Superintendent, Trenton.

Oxford Iron Co., Oxford, Warren county. Built in 1866; 25 puddling furnaces, 6 heating furnaces, 4 spike furnaces, 86 nail machines, and 4 trains of rolls (one 10, one 12, and two 23-inch); product, merchant bar, spike rods, nails, railroad spikes, fish joints, nuts and bolts; annual capacity, 16,000 net tons; average make, 15,000 tons. S. T. Scranton, President. *See Furnaces.*

Passaic Rolling Mills, Passaic Rolling Mill Co., Paterson, Passaic county.

Built in 1867, and incorporated in 1869; 8 double puddling furnaces, 5 heating furnaces, 3 trains of rolls, and 1 hammer; product, beams, channels, angles, tees, and other shapes for buildings and bridges, merchant bars, rivets, nuts, etc.; annual capacity, 12,000 net tons. Watts Cooke, President, and W. O. Fayerweather, Secretary and Treasurer.

Powerville Iron Works, John Leonard, lessee, Boonton. Works at Powerville. Built in 1845; 3 charcoal bloomary fires, 1 heating furnace, 2 trains of rolls, and 1 hammer; water-power; product, hoops, rods, and small bars to 2 inches in width, blooms and slabs; annual capacity, 1,000 net tons merchant iron, and 900 tons blooms and slabs. *See Bloomaries.*

Roebbling's Sons, J. A., Trenton. Old mill built in 1852, new mill in 1873; 4 heating furnaces, 4 trains of rolls, 8 charcoal bloom fires, and one 3-ton steam hammer; product, wire rope and merchant rods; annual capacity, 9,000 net tons.

Trenton Iron Co., Trenton. Built in 1845; 8 charcoal fires, 3 heating furnaces, 2 hammers, and 3 trains of rolls (one 8, one 12, and one 19-inch); crucible steel works; wire works, with 50 large blocks, and 150 small blocks; product, steel, bar iron, and wire; annual capacity, 5,000 net tons of bar iron and wire. Charles Hewitt, President, and James Hall, Treasurer. Cooper, Hewitt & Co., 17 Burling Slip, New York.

Number of mills in New Jersey: 16. Of these, 1 rolls rails.

PENNSYLVANIA.

EASTERN DISTRICT.

Allentown Rolling Mill Co., consolidation of Allentown Rolling Mill, Lehigh Rolling Mill, and Roberts Iron Co. Works at Allentown, Lehigh county. Office, 303 Walnut street, Philadelphia. Built in 1860; 2 single and 23 double puddling furnaces, 11 single heating furnaces, and 8 trains of rolls; product, T and street rails, from 16 lbs. upwards, fish plates, merchant bars, spikes, bolts, nuts, rivets, axles, machinery, bridge work, and mine and flat cars. A. Pardee, Jr., President; C. W. Leavitt, Secretary; H. W. Allison, Treasurer, and C. H. Nimson, Superintendent. *See Lehigh Valley Furnaces.*

Bethlehem Iron Co., Bethlehem, Northampton county. Built in 1863. Mill No. 1; 14 double puddling furnaces, 9 heating furnaces, and 3 trains of rolls; product, railroad iron; annual capacity, 22,500 net tons; average annual production, 18,000 tons. Mill No. 2; shaped like a double cross, 931 feet long, each arm being 386 feet by 111 feet; 24 and 26-inch rail trains, 124 feet 9 inches in length from centre to centre of engines; north engine, 48 in. x 46 in. stroke; south engine, 56 in. x 48 in. stroke;

- one 31-inch bloom train, with one engine 36-inch diameter and 60-inch stroke. Steel works; 2 5-ton converters, equal to 120 tons Bessemer steel per day; cupola engine, 18 in. x 48 in.; blowing engine, 36 in. x 60 in.; 7 Siemens regenerative gas furnaces for heating ingots and blooms; 4 cupola furnaces, and 2 spiegel-melting furnaces. Alfred Hunt, President; Abraham S. Schropp, Secretary; C. O. Brunner, Treasurer, and John Fritz, Superintendent. *See Lehigh Valley Furnaces.*
- Birdsboro Nail Works, E. & G. Brooke, Birdsboro, Berks county. Built in 1848; 7 double puddling furnaces, 2 scrap and 3 heating furnaces, 72 nail machines, and 2 trains of rolls; steam and water power; product, nails. *See Schuylkill Valley Furnaces.*
- Blandon Iron Works, Blandon Iron Co., Blandon, Berks county. Built in 1867; 1 double and 3 single puddling furnaces, 1 heating furnace, and 2 trains of rolls; product, skelp and band iron; annual capacity, 2,500 net tons; average yearly product, 1,800 tons.
- Brandywine Rolling Mills, S. & B. R. Hatfield, Coatesville, Chester county. Built in 1845; two mills, run by water-power, one-fourth of a mile apart; 2 heating furnaces, and 2 trains of rolls; product, plate iron; annual capacity, 2,000 net tons. Puddling department in Huntingdon county, Pa. *See Bloomeries.*
- Bristol Rolling Mill, Bristol Rolling Mill Co., Bristol, Bucks county. Built in 1875; 1 heating furnace, and 2 trains of rolls (one 8 and one 12-inch); product, hoop, scroll, bar and band iron; annual capacity, 1,200 net tons. Fred. Nevigold, President; Geo. F. Pierson, Secretary, and Edwin Manship, Treasurer.
- Catasauqua Manufacturing Co., Catasauqua, Lehigh county. Two mills: Catasauqua and Ferndale. Company organized in 1864; 27 single puddling furnaces, 9 heating furnaces, 7 trains of rolls (10, 15, 18, and 22-inch), and one 10-ton hammer; product, merchant bar, small T rail, car axles, shafting, and iron and steel sheets and plates; annual capacity, 20,000 net tons. Oliver Williams, Manager.
- Chester Rolling Mills, Chester, Delaware county. Built in 1875; 6 puddling furnaces, 2 Siemens heating furnaces, and 3 trains of rolls; product, boiler and ship plate. John Roach, President, and C. B. Houston, Secretary.
- Conshohocken, Pennsylvania, and Corliss Iron Works, J. Wood & Brothers, Conshohocken, Montgomery county. Office, 223 North Second street, Philadelphia. Built in 1832, 1852, and 1864, respectively; 6 double puddling furnaces, 7 heating furnaces, and 7 20-inch trains of rolls; steam and water power; product, plate and sheet iron, embracing flue, boiler, tank, gasometer, nail, tack, shovel, and safe iron; annual capacity, 6,000 net tons; average yearly production, 5,000 tons.

Delaware Rolling Mills, Hughes & Patterson, Richmond and Otis streets, Kensington, Philadelphia. Built in 1870; 8 single puddling furnaces, 4 heating furnaces, and 3 trains of rolls; product, merchant bar iron; annual capacity, 8,000 net tons.

Easton Sheet Iron Works, Samuel Oliver & Son, Easton, Northampton county. Built in 1871, and put in operation February 1, 1872; 2 single puddling furnaces, 1 heating furnace, 1 sheet furnace, 1 annealing furnace, and 1 train of 22-inch rolls, consisting of 1 pair sheet rolls, and 1 pair bar rolls; product, sheet iron; annual capacity, 1,000 net tons; average yearly production, 900 tons. Production sold by Marshall Leferts, Jr., 90 Beekman street, New York.

Fair Hill Forge and Rolling Mill, Gaulbert, Morgan & Caskey, York and America streets, Philadelphia. Built in 1854; 1 single and 2 double puddling furnaces, 3 heating furnaces, 2 trains of rolls, and 1 hammer; product, merchant bar; annual capacity, 4,000 net tons.

Fort Allen Iron Works, Weissport, Carbon county. Ezra Bertolet, Agent, 250 South Fourth street, Philadelphia. Rebuilt in 1872; 1 single and 2 double puddling furnaces, 2 heating furnaces, 1 squeezer, and 2 trains of rolls (one 9, and one 16-inch); product, guide and bar iron; annual capacity, 3,000 net tons. Not in operation in 1875.

Fulton Rolling Mill, Phila. and Reading Coal and Iron Co., Norristown, Montgomery county. Built in 1861; 11 double puddling furnaces, 1 rotary squeezer, and 1 train 18-inch puddle rolls; product, puddled bar; annual capacity, 15,000 net tons; average make, 5,550 tons. This mill is now standing, and is for sale or to rent. Agent, W. E. C. Coxe, Reading.

Gibraltar Iron Works, S. Seyfert & Co., Reading. Built in 1846; 2 heating furnaces, 2 hammers, and one 16-inch train of rolls; water-power; product, boiler plate, boiler tube iron, and charcoal blooms; annual capacity, 1,500 net tons plate iron, and 1,000 tons blooms.

Glasgow Iron Works, Glasgow Iron Co., Pottstown, Montgomery county. Built in 1874; 4 double puddling furnaces, and 1 train of muck rolls; water-power; annual capacity, 5,000 net tons. A plate mill will soon be added, to be operated by steam, and to contain 3 heating furnaces and 1 train of rolls, 96 inches long. Annual capacity, to be 6,000 net tons. Boiler plate quality a specialty. Joseph L. Bailey, President; Comly B. Shoemaker, Treasurer; G. W. Nicolls, Secretary, and Edward Bailey, General Manager.

Glen Iron Works, Allentown. First put in operation in 1870; 6 double and 2 single puddling furnaces, 3 heating furnaces, and 3 trains of rolls (one 8½ and two 15-inch); product, bar iron and small T rails; annual capacity, 7,500 net tons; average make, 5,400 tons. Joseph Downing, Superintendent. Not in operation in 1875.

Gray's Ferry Iron Works, Edward S. Buckley, 228½ Walnut street, Philadelphia. Built in 1858; 3 double puddling furnaces, 4 charcoal forge fires, 4 heating furnaces, 2 trains of rolls, and 2 hammers; product, plate iron and charcoal blooms; annual capacity, 3,600 net tons plate, and 600 tons blooms; average annual production, 3,000 tons plate, and 500 tons blooms.

Hamburg Iron Works (Phila. and Reading R. R. Co., owners), James Henderson, lessee, Hamburg, Berks county. Built in 1865; 3 double and 2 single puddling furnaces, 4 heating furnaces, and 2 trains of rolls (10 and 18-inch); product, bar iron of high class for machinery and tools by the Henderson process; annual capacity, 4,000 net tons.

Hibernia Forge and Rolling Mill, Goodman & Phillips, Wagontown, Chester county. Very old works; 4 charcoal forge fires, 1 heating furnace, 1 hammer, and 1 train of rolls; use wrought scrap; water-power; product, boiler-tube iron, skelp, flue, and light boiler plate; annual capacity, 1,000 net tons.

Kensington Iron and Steel Works, James Rowland & Co., 920 North Delaware avenue, Philadelphia. Built in 1845; 1 single and 10 double puddling furnaces, 8 heating furnaces, and 7 trains of rolls; product, merchant bar, band, and skelp iron, and steel plow and shovel plate; annual capacity, 11,000 net tons; average yearly production, 10,000 tons.

Keystone Iron Works, Reading, Berks county. Built in 1857; 5 single puddling furnaces, 2 heating furnaces, and one 16-inch train of rolls; product, boiler plate, tank, chute, stack, pipe, boat, and car iron, and muck bars; annual capacity, 2,000 net tons; average yearly production, 1,800 tons. J. V. Craig, President; Jacob Snell, Secretary, and John H. Craig, Treasurer.

Laurel Iron Works, Hugh E. Steele, Coatesville, Chester county. Built in 1825; 1 annealing furnace, 4 heating furnaces, and 3 trains of rolls; water and steam power; product, boiler, flue, boat, bridge, tank, and tube iron; annual capacity, 4,800 net tons; average make, 3,600 tons.

Little Schuylkill Rolling Mill, James A. Inness, Port Clinton, Schuylkill county. Built in 1868; 1 double and 2 single puddling furnaces, 1 heating furnace, and 3 trains of rolls (one 10, one 16, and one 18-inch); water-power; product, merchant bar, and small T rails; annual capacity, 3,000 net tons merchant bar.

Lukens Roll Mills, Huston & Penrose, Coatesville. Built in 1810; 3 double puddling furnaces, 4 heating furnaces, 2 trains of rolls, and 1 hammer; steam and water power; product, all kinds of flue, boiler and ship plates, and bridge iron; annual capacity, 6,000 net tons; average yearly production, 4,000 tons. The puddle mill, operated by water-power, occupies the site of the first plate mill built in the United States.

McIlvain (Wm.) & Sons' Boiler Plate Mill, Wm. McIlvain & Sons, Reading. Built in 1857; 4 single puddling furnaces, 3 heating furnaces, 2 trains of rolls, and one 3-ton hammer; product, boiler plate, tank, chute, stack, pipe, bridge, and boat iron; annual capacity, 4,500 net tons; average yearly production, 4,000 tons. *See Bloomaries.*

Mill Creek Iron Co., Mount Carbon, Schuylkill county. Four double puddling furnaces, 3 heating furnaces, and 3 trains of rolls (one 16, one 18, and one 24-inch); product, merchant bar and plate iron. *See Schuylkill Valley Furnaces.*

Norristown Iron Works, James Hooven & Sons, Norristown, Montgomery county. Built in 1846; 6 double puddling furnaces, 3 heating furnaces, 3 trains of rolls, and 1 hammer; product, skelp iron; annual capacity, 5,000 net tons; average yearly production, 4,800 tons. James Hooven, owner. *See Schuylkill Valley Furnaces.*

Oxford Iron and Steel Works, William & Harvey Rowland, Frankford, Philadelphia. Built in 1842, and very much enlarged recently, especially in 1873; 3 heating furnaces, 3 trains of rolls, 1 hammer, 4 converting furnaces using wood exclusively, 2 converting furnaces using coal, and 24 2-pot crucible steel melting furnaces; convert iron into steel, reroll Norway iron, slit Norway nail rods, and make elliptic springs, sheet cast steel, cast spring steel, machinery and plow steel, and tire and sleigh steel; annual capacity, 4,500 net tons; average make, 2,500 tons.

Palo Alto Rolling Mill, Benjamin Haywood, Pottsville, Schuylkill county. Built in 1854; 12 double and 5 single puddling furnaces, 9 heating furnaces, and 5 trains of rolls (one 8, two 16, and two 18-inch); product, light and heavy T and street rails, fish bars, chairs, and merchant bar iron; annual capacity, 15,000 net tons; average yearly product, 10,000 tons.

Parkesburg Iron Works, Horace A. Beale, Parkesburg, Chester county. First started in April, 1873; 4 charcoal forge fires, 2 heating furnaces, 1 train of rolls, and 1 hammer; product, blooms and tube skelp; annual capacity, 2,500 net tons.

Pencoyd Iron Works, A. & P. Roberts & Co., 265 South Fourth street, Philadelphia. Works in Montgomery county, opposite Manayunk. Built in 1852; 9 double puddling furnaces, 10 heating furnaces, rotary squeezer, and 2 trains of rolls (18 and 23-inch); product, channel bars, tee and angle iron, hammered axles, rolled axles, and bar and bridge iron; the forge has 4 hammers; annual capacity, 10,000 net tons; average yearly production, 8,000 tons.

Penn Treaty Iron Works, Marshall, Brothers & Co., 24 Girard avenue, Philadelphia. Built in 1856; 6 single puddling furnaces, 6 heating fur-

naces, and 4 trains of rolls; product, sheet and bar iron; annual capacity, 4,000 net tons.

Philadelphia Iron and Steel Co., 939 North Delaware avenue, Philadelphia. Built in 1845; 1 single and 2 double puddling furnaces, 1 rotary squeezer, 7 heating furnaces, and 5 trains of rolls (two 8, one 12, and two 18-inch); product, bar, angle, and tee iron, fish plates, beams, street rails, and peculiar shapes; average annual capacity, single turn, 8,000 net tons.

Philadelphia Rolling Mill, S. Robbins & Son, Beach and Vienna streets, Kensington, Philadelphia. Built in 1858; 9 double puddling furnaces, 5 heating furnaces, and 4 trains of rolls; product, merchant bar iron of all kinds; annual capacity, 14,000 net tons; average yearly production, 9,000 tons. *See Schuylkill Valley Furnaces.*

Philadelphia and Reading Rolling Mill, Philadelphia and Reading R. R. Co., owners, W. E. C. Coxe, Superintendent, Reading. Built in 1868; 12 single puddling furnaces, 10 heating furnaces, and 3 trains of rolls (one 23, one 24, and one 12-inch); product, iron and steel rails and splice bars; annual capacity, 25,000 net tons; average yearly production, 22,400 tons.

Phoenix Iron Works, Phoenix Iron Co., Phoenixville, Chester county. Office, 410 Walnut street, Philadelphia. Built in 1808; 20 double and 8 single puddling furnaces, 23 heating furnaces, and 5 trains of rolls (one 9, one 12, one 16, and two 18-inch); product, bar iron, beams, angles, tee iron and other shapes; annual capacity, 25,000 net tons; average yearly production, 20,000 tons. The Company is building a new mill, of greater capacity than the old one. Samuel J. Reeves, President; John Griffen, Superintendent; Geo. Gerry White, Secretary, and James O. Pease, Treasurer. *See Schuylkill Valley Furnaces.*

Pine Iron Works, Joseph L. Bailey & Co., Pine Iron Works, Berks county. Built in 1845; 2 heating furnaces and 1 train of rolls; water-power; product, boiler plate; annual capacity, 2,600 net tons; average yearly production, 2,300 tons. Sole manufacturers of the "Pine" brands of extra flange and fire-box iron.

Potts Grove Iron Works, Potts Brothers, Pottstown, Montgomery county. Built in 1846; 2 double puddling furnaces, 3 heating furnaces, and 2 trains of rolls; product, plate iron, comprising boiler, tank, pipe, and flue iron; annual capacity, single turn, 3,000 net tons; average yearly production, 2,500 tons. This firm also has an 8-inch bar mill, 3,000 net tons yearly capacity, which has not been worked for 15 years.

Pottstown Iron Co., Pottstown, Montgomery county. Built in 1867; 14 double puddling furnaces, 6 heating furnaces, 4 trains of rolls, 54 nail machines, 1 hammer, and 1 squeezer; product, nails, and boiler, ship,

- and tank plate iron; annual capacity, nails, 6,000 net tons, plate, 6,000 tons. President, Theo. H. Morris; Vice-President, Andrew Wheeler; Secretary, Joseph K. Wheeler; and Treasurer and General Manager, Wm. H. Morris. *See Schuylkill Valley Furnaces.*
- Pottsville Rolling Mills, Atkins Brothers, Pottsville. Built in 1852; 14 double and 4 single puddling furnaces, 8 heating furnaces, and 3 trains of rolls; product, T rails of both light and heavy sections, and street rails. *See Schuylkill Valley Furnaces.*
- Reading Bolt and Nut Works, J. H. Sternbergh, Reading. Built in 1865; enlarged in 1872; 1 single puddling furnace, 2 heating furnaces, 1 10-inch train of rolls, and 1 hammer; product, merchant bar iron, machine bolts, lag screws, rods for buildings, bridges, etc., and hot pressed nuts of all sizes; annual capacity, about 3,000 net tons; average yearly production, 2,500 tons.
- Reading Iron Works, Seyfert, McManus & Co., Reading. Office, 631 Chestnut street, Philadelphia. Built in 1836; 12 single puddling furnaces, 4 heating furnaces, 1 rotary squeezer, 3 trains of rolls, 30 nail machines, and 2 railroad spike machines; product, cut nails, bar, band, hoop, and skelp iron; annual capacity, 5,500 net tons; average yearly product, 5,000 tons. Plate mill built in 1862; 7 double puddling furnaces, 4 heating furnaces, 1 hammer, and 4 trains of rolls; product, sheet, plate, and bar iron; annual capacity, 6,800 net tons; average yearly production, 6,000 tons. *See Schuylkill Valley Furnaces.*
- Schuylkill Iron Works, Alan Wood & Co., Conshohocken. Office, 519 Arch street, Philadelphia. Built in 1858; 16 double puddling furnaces, 12 heating and 4 grate furnaces, 7 trains of rolls, 1 hammer, and 2 rotary squeezers; product, sheet and plate iron; annual capacity, 15,000 net tons. *See Rolling Mills in Delaware.*
- Schuylkill Haven Rolling Mill and Spike Manufacturing Co., Weissinger & Medlar, Schuylkill Haven, Schuylkill county. Put in operation November 1, 1873; 2 heating furnaces, 2 trains of rolls (one 8 and one 16-inch), and 1 railroad spike machine; product, merchant bar iron, small T rails, and railroad spikes; annual capacity, 3,000 net tons.
- Stewart & Co., Easton, Northampton county. Built in 1837; 4 heating furnaces, and 2 trains of rolls; product, wire rods, drawn into wire at the same establishment; annual capacity, 5,000 net tons.
- Stony Creek Iron Works, Schall & Co., Norristown, Montgomery county. Built in 1849; 5 double puddling furnaces, 4 heating furnaces, 3 trains of rolls, and 29 nail machines; product, bar, sheet, boiler plate, and nails. No nails made since 1872. *See Schuylkill Valley Furnaces.*
- Tamaqua Rolling Mill, Wm. T. Carter & Co., Tamaqua, Schuylkill county. Office, 103 Walnut street, Philadelphia. Built in 1865; 2 double and 3

- single puddling furnaces, 2 heating furnaces and 2 trains of rolls (one 8½ and one 16-inch); product, merchant bar iron, iron and steel mine T rails, and railroad spikes; annual capacity, 3,000 net tons; average yearly production, 2,500 tons. *See Coleraine Furnaces, Lehigh Valley.*
- Thorndale Iron Works, Wm. L. Bailey & Co., Thorndale Iron Works, Chester county. Built in 1847; 1 double and 2 single puddling furnaces, 2 heating furnaces, 2 trains of rolls (plate train 73 inches long), and 1 hammer; product, boiler-plate iron; annual capacity, 3,000 net tons; average make, 2,250 tons.
- Tioga Rolling Mill, Noblit & Brother, Germantown Junction, Philadelphia. Put in operation January 1, 1873; 2 heating furnaces, 2 trains of rolls (one 8 and one 10-inch), 1 hammer, and 3 spike machines; product, hoop, band, scroll, horse-shoe, and guide iron, and railroad spikes; annual capacity, 2,500 net tons.
- Valley Iron Works, C. E. Pennock & Co., Coatesville, Chester county. Built in 1837; 4 double puddling furnaces, 4 heating furnaces, one 4-ton steam hammer, and 4 trains of rolls (one 18, one 24, and two 30-inch); product, plate iron; annual capacity, 7,000 net tons; average make, 6,000 tons. *See Bloomaries.*
- Viaduct Iron Works, Hugh E. Steele, lessee, Coatesville. Built in 1838; 3 single puddling furnaces, 8 heating furnaces, 4 trains of rolls, and 1 hammer; product, all kinds of boiler, fire-box, boat, tank, tube and flue iron, and patent straightened bridge plates; annual capacity, 11,000 net tons; average make, 8,000 tons. *See Laurel Iron Works.*
- Winch (Corydon), Canal street, Kensington, Philadelphia. New mill built in 1874; 1 double and 2 single puddling furnaces, 2 heating furnaces, 4 trains of rolls, 12 spike machines, and 4 rivet machines; product, spike and rivet iron; average annual product, 3,000 net tons.
- Number of mills in Philadelphia: 11. Total in Eastern Pennsylvania: 53. Of these 11 roll rails, 5 making only light T rails, and 1 only street rails.

CENTRAL DISTRICT.

- Altoona Iron Works, Altoona Iron Co., Altoona, Blair county. First put in operation in April, 1873; 1 double and 6 single puddling furnaces, 3 heating furnaces, 3 trains of rolls (one 8, one 16, and one 18-inch), and 1 rotary squeezer; product, bar, band, and hoop iron; annual capacity, 8,000 net tons. S. C. Baker, President, and A. H. Voris, Treasurer.
- Berwick Rolling Mill, Berwick Rolling Mill Co., Berwick, Columbia county. Built in 1872; 5 single puddling furnaces, 2 heating furnaces, and 3 trains of rolls; product, bar iron; annual capacity, 3,600 net tons. C. G. Jackson, President, and C. R. Woodin, Vice-President.
- Central Iron Works, Harrisburg, Dauphin county. Built in 1853; 4 sin-

gle puddling furnaces, 2 heating furnaces, 1 20-inch train of rolls, and 1 hammer; product, boiler-plate and tank iron; annual capacity, 3,500 net tons; average annual production, 3,000 tons. Charles L. Bailey, President; A. Wilhelm, Vice-President, and Samuel R. Matlack, Secretary.

Chesapeake Nail Works, Chas. L. Bailey & Co., Harrisburg, Dauphin county. Built in 1867; 14 single puddling furnaces, 3 heating furnaces, 2 trains of rolls (20-inch puddle, and 16-inch plate), and 66 nail machines; product, nails; annual capacity, 7,500 net tons; average annual production, 7,000 tons.

Chickies Rolling Mill, Becker & Reinhold, Chickies, Lancaster county. Built in 1865; 1 single and 3 double puddling furnaces, and 2 trains of rolls (9 and 16-inch); product, muck bar; annual capacity, 4,000 net tons; average yearly production, 2,500 tons.

Codorus Steel Works, York County Iron and Steel Co., York, York county. Built in 1869; 10 single puddling furnaces, 2 heating furnaces, 2 trains of rolls, and 1 hammer; product, principally puddled steel for heading iron rails; annual capacity, 7,500 net tons. Not in operation in 1875.

Columbia Steel and Iron Works, Maitland, Audenreid & Co., Columbia. Office, N. E. corner Third and Dock streets, Philadelphia. Built in 1854; product, rails, bars, and rods.

Co-operative Iron and Steel Works, Danville, Montour county. Built in 1871; 8 single puddling furnaces, 4 heating furnaces, and 2 trains of 18-inch rolls; product, all sizes of T rails from 16 to 65 lbs. per yard; street rails a specialty; annual capacity, 10,000 net tons. The machinery is fitted for 25,000 tons, needing only additional heating furnaces. John Grove, Sr., President, and L. K. Rishel, Secretary, Treasurer and Manager.

Crescent Iron and Nail Works, E. G. Heylman, Cogan Station, Lycoming county. Built in 1842; 2 single puddling furnaces, 1 heating furnace, 1 train of rolls, and 7 nail machines; water-power; product, bar iron and nails.

Danville Iron Works, William Faux, Danville. Built in 1870; 4 heating furnaces, and 1 train of 16-inch rolls; product, T rails from 16 to 56 lbs. per yard, inclusive; annual capacity, 11,000 net tons.

Duncannon Iron Company, Duncannon, Perry county. Office, 122 Race street, Philadelphia. Built in 1838; 11 single puddling furnaces, 5 heating furnaces, 4 trains of rolls, and 52 nail machines; steam and water power; product, bar iron and nails. William Wister, President; John Wister, Treasurer, and William E. S. Baker, Secretary and Assistant Treasurer. *See Upper Susquehanna Furnaces.*

Eagle Iron Works, C. Curtin & Co., Roland, Centre county. Built in 1810; 1 single puddling furnace, 1 heating furnace, 2 trains of rolls, and 1 squeezer; water-power; product, bar iron, boiler covers, and assorted iron from $\frac{1}{2}$ -inch round and square to $4\frac{1}{2}$ -inch tire; annual capacity, 2,000 net tons; average annual production, 1,300 tons. *See Charcoal Furnaces. See Bloomaries.*

Hancock Steel and Iron Co., Danville, Montour county. Built in 1847; product, rails. Formerly owned by National Iron Co., and afterwards by Hancock, Creveling & Co. Benjamin G. Welch, Secretary. *See Upper Susquehanna Furnaces.*

Harrisburg Nail Works, Harrisburg. Works at West Fairview, Cumberland county. Built in 1810; 9 double puddling furnaces, 6 heating furnaces, 2 trains of rolls, and 73 nail machines; steam and water power; product, nails and muck bars; annual capacity, 7,500 net tons of nails, and 2,000 tons of muck bars; average yearly production, 6,300 tons of nails, and 1,500 tons of muck bars. Henry McCormick, Treasurer.

Hollidaysburg Iron Works, Hollidaysburg Iron and Nail Co., Hollidaysburg, Blair county. Built in 1860; 8 single puddling furnaces, 3 heating furnaces, 3 trains of rolls, and 18 nail machines; product, bars, light T rails, and nails; annual capacity, 3,500 net tons; average annual production, 2,000 tons. J. W. Bracken, President. *See Juniata Rolling Mill.*

Howard Iron Works, Lauth, Thomas & Co., Howard, Centre county. Built in 1840; 6 single puddling furnaces, 2 heating furnaces, and 3 trains of rolls (one 16, one 12, and one 8-inch), and 1 rotary squeezer; water-power; product, all sizes merchant bar, band, hoop, and guide iron; annual capacity, 3,600 net tons finished iron. The establishment includes a large warehouse, in which a stock of 300 tons of all kinds of bar iron is constantly kept on hand. *See Bituminous Furnaces. See Charcoal Furnaces.*

Juniata Rolling Mill, Hollidaysburg Iron and Nail Co., lessees, Hollidaysburg. Built in 1866; 9 single puddling furnaces, 3 heating furnaces, 2 trains of rolls, 30 nail machines, and 1 hammer; product, sheets and nails; annual capacity, 3,500 net tons; average annual production, 2,000 tons. *See Hollidaysburg Iron Works.*

Lackawanna Iron Works, Lackawanna Iron and Coal Co., Scranton, Luzerne county. Commenced in 1840; 113 single puddling furnaces, 35 heating furnaces, and 12 trains of rolls (one 31, one $23\frac{1}{2}$, two 23, two 22, two 20, three 18, and one 8-inch), and 1 hammer; steam and water power; product, light and heavy railroad iron, merchant bar iron, and car axles; annual capacity, 112,000 net tons of rails, and 13,500 tons of

- merchant bar iron and car axles. Bessemer steel works added in 1875; two 5-ton converters, 4 cupola furnaces, and 4 spiegel-melting cupolas; annual capacity, 45,000 net tons ingots; first blow made Oct. 23, 1875; first steel rail rolled Dec. 29, 1875. President, W. W. Scranton; Secretary, Edward C. Lynde, Scranton, Pa.; and Treasurer, E. F. Hatfield, Jr., 52 Wall street, New York. *See Upper Susquehanna Furnaces.*
- Lancaster Manufacturing Co., C. A. Bitner, Lancaster. Put in operation in April, 1873; 8 single puddling furnaces, 3 heating furnaces, 3 trains of rolls (one 18-inch puddle, one 16-inch bar, and one 8-inch guide), and 2 hammers; product, bar iron, splice bar, axles, bolts, spikes and forgings; annual capacity, 3,600 net tons. Not in operation in 1875.
- Lancaster Rolling Mill, Manuel McShain & Co., Hempfield, Lancaster county. Office, 140 Walnut street, Philadelphia. Bought by present parties and enlarged in June, 1872; 1 double and 5 single puddling furnaces, 2 heating furnaces, 2 trains of rolls, and 1 hammer; product, merchant bar and guide iron; annual capacity, 3,000 net tons.
- Lebanon Rolling Mill, A. W. Bowman, Lebanon. Built in 1867; 4 double puddling furnaces, 6 heating furnaces, 5 trains of rolls, and 1 hammer; product, plate, sheet, and flue iron, and muck bar; annual capacity, 4,500 net tons; average make, 3,000 tons.
- Lochiel Rolling Mill Co., Harrisburg. Built in 1865; merchant mill completed in November, 1871; 8 double and 4 single puddling furnaces, 8 heating furnaces for rails, 4 heating furnaces for the merchant mill, and 4 trains of rolls (one 16 and three 18-inch); product, rails from 15 lbs. per yard upward, bar iron and splice bars; annual capacity, 25,000 net tons rails, and 3,000 tons merchant iron and splice bars. Henry McCormick, President, and A. J. Dull, General Manager. *See Lower Susquehanna Furnaces.*
- Logan Iron Works, Valentine & Co., Bellefonte, Centre county. Built in 1825; product, bars and rods. *See Charcoal Furnaces. See Bloomaries.*
- Logan Works, Logan Iron and Steel Co., Lewistown, Mifflin county. Office, 218 South Fourth street, Philadelphia. Built in 1869; forge very old; 3 single puddling furnaces, 3 heating furnaces, 1 train of rolls, 1 steam hammer, and 3 water hammers; steam and water power; product, hammered and rolled bar, and blooms. The Company has a plate mill not now in use, containing one 30-inch train of rolls, 3 heating furnaces, etc. Another part of the establishment, comprising a large steam hammer and a tire mill, is rented to the Standard Steel Works. President, John M. Kennedy; Secretary, C. Weston, Jr.; Treasurer, H. T. Townsend, and Superintendent, R. H. Lee. *See Charcoal Furnaces. See Bloomaries.*
- Milesburg Iron Works, McCoy & Linn, Milesburg, Centre county. Built

in 1830; 3 single puddling furnaces, 2 heating furnaces, 3 trains of rolls, and 2 hammers; steam and water power; product, all sizes bar iron, spring and soft rods, and spring and soft wire of all numbers; annual capacity, 3,000 net tons; average yearly production, 1,576 tons. *See Charcoal Furnaces. See Bloomaries.*

Milton Nail Works, C. A. Godcharles & Co., Milton, Northumberland county. Built in 1875; put in operation Oct. 28, 1875; 5 single puddling furnaces, 1 heating furnace, 16 nail machines, and one 20-inch train of rolls; product, nails.

Milton Rolling Mill, Milton Iron Co., Milton, Northumberland county. Put in operation December 1, 1872; 6 puddling furnaces, 1 heating furnace, and 3 trains of rolls; product, round, square, and flat bar iron; annual capacity, 2,000 net tons; average yearly production, 1,500 tons. W. A. Schreyer, President, and P. C. Johnson, Treasurer.

Northumberland Iron and Nail Works, Van Alen & Co., Northumberland, Northumberland county. Built in 1867; 7 single puddling furnaces, 1 heating furnace, 1 train of rolls, and 21 nail machines; product, nails, nail plate, muck and scrap bars; annual capacity, 5,500 net tons muck bar, 4,000 tons nail plate, 2,500 tons nails.

Paxton Rolling Mills, McCormick's Estate, Harrisburg. Built in 1869; 5 double puddling furnaces, 5 heating furnaces, 3 trains of rolls, and 1 hammer; product, boiler, skelp, and tank iron; annual capacity, 8,750 net tons. John Q. Denny, Manager.

Pennsylvania Iron Works, Waterman & Beaver, Danville. Office, 407 Library street, Philadelphia. Built in 1845; 22 double and 16 single puddling furnaces, 15 heating furnaces, 4 trains of rolls, and 1 hammer; product, railroad iron; annual capacity, 40,320 net tons; average yearly production, 27,242 tons. *See Upper Susquehanna Furnaces.*

Pennsylvania Steel Works, Pennsylvania Steel Co., Steel Works P. O., Baldwin Station, Dauphin county. Office, 216 South Fourth street, Philadelphia. Bessemer steel works built in 1865-7; two 5-ton converters; capacity, 220 net tons steel every 24 hours. Rolling mill built in 1867-8, and since enlarged; daily capacity, single turn, 100 tons steel rails. Hammer mill contains 6 and 12-ton hammers, the larger turning out 75 to 80 tons of blooms and forgings every 24 hours. 2 Siemens open-hearth steel furnaces. Product, steel ingots, forgings, rails of heavy sections, street rails, and railroad axles, crossings, frogs, and switches. Capacity, 45,000 net tons ingots per annum. S. M. Felton, President; E. F. Barker, Secretary; H. C. Spackman, Treasurer; C. S. Hinchman, Sales Agent, and Luther S. Bent, Superintendent. *See Lower Susquehanna Furnaces.*

Portage Iron Works, John Musselman, Duncansville, Blair county. Built

in 1839; 8 single puddling furnaces, 2 heating furnaces, 4 trains of 18-inch rolls, and 37 nail machines; product, nails; annual capacity, 4,600 net tons; average annual production, 1,250 tons.

Safe Harbor Rolling Mill, Reeves, Abbott & Co., Safe Harbor, Lancaster county. Built in 1848; 16 double and 2 single puddling furnaces, 8 heating furnaces, and 2 trains of rolls; product, railroad iron; has made 12,000 net tons of rails a year; has not made any rails since 1861, and the mill has not been in operation since 1865; upon the completion of a railroad, now in course of construction, this mill will in all probability again be used. *See Lower Susquehanna Furnaces.*

Susquehanna Iron Works, Susquehanna Iron Co., Columbia. Three heating and 12 single puddling furnaces; product, bar iron. Wm. Patton, Treasurer.

Towanda Iron Manufacturing Co., Towanda, Bradford county. First started in November, 1872; 3 double puddling furnaces, 3 heating furnaces, 24 nail machines, and 2 trains of rolls (15-inch puddle and 15-inch plate); product, nails (from pig and scrap); annual capacity, 1,500 net tons; average annual production, 1,200 tons.

Valentine Iron Co., Williamsport, Lycoming county. Built in 1873-4; 4 single puddling furnaces, 2 heating furnaces, 8 forge fires, 1 hammer, and 3 trains of rolls (one 8 and two 15-inch); product, charcoal blooms, bars, and wire rods; annual capacity, 4,000 net tons. Mahlon Fisher, President, and E. M. Valentine, Agent.

Van de Sand & Capp, Lebanon. Product, plate and sheet iron.

Number of mills in Central Pennsylvania: 37. Of these, 10 roll rails, 1 making light T rails only.

WESTERN DISTRICT.

Allegheny and Monongahela Iron Works, Lewis, Oliver & Phillips, Pittsburgh, Allegheny county. Built in 1866 and 1864, respectively; 60 single puddling furnaces, 12 heating furnaces, 2 rotary squeezers, and 8 trains of rolls (two puddle, two 16-inch bar, one 10-inch bar, and three 8-inch bar trains); product, bar iron, round, square and oval, bands, and peculiar and odd shapes, bolts, nuts, washers, hinges, and other wrought iron hardware; annual capacity, 40,000 net tons.

American Iron Works, Jones & Laughlins, Pittsburgh. Built in 1852; 75 single puddling furnaces, 30 heating furnaces, 18 trains of rolls, and 73 nail machines; product, bars, nails, hoops, railroad spikes, plates, sheets, cold-rolled shafting, and 8 to 40-lb. T rails; annual capacity, 50,000 net tons.

Anchor Nail and Tack Works, Chess, Smyth & Co., Pittsburgh. Built in 1837; 20 single puddling furnaces, 5 heating furnaces, 4 trains of rolls, 90 nail machines, 50 tack machines, and 1 hammer; product, nails, tacks, and brads; annual capacity, 6,000 net tons.

- Atlantic Iron and Nail Works, Kimberly, Carnes & Co., Sharon, Mercer county. 28 puddling furnaces, 6 heating furnaces, and 40 nail machines; product, bar, plate, hoop, and rod iron, and nails; annual capacity, 8,000 net tons. *See Shenango Valley Furnaces.*
- Birmingham Iron Works, McKnight, Duncan & Co., Pittsburgh. Built in 1836; 20 single puddling furnaces, 5 heating furnaces, and 5 trains of rolls; product, merchant bar iron, rounds, squares, ovals, half ovals, bands, hoops, etc.; annual capacity, 10,000 net tons; average yearly production, 9,000 tons. In hands of assignees.
- Brady's Bend Iron Co., Brady's Bend, Armstrong county. Office, 54 Cliff street, New York. Built in 1842; under present management from 1862; 28 single puddling furnaces, 12 heating furnaces, and 3 trains of rolls; product, railroad iron; annual capacity, 20,000 net tons; average yearly production, 11,000 tons. Geo. M. Wheeler, President, New York. Not in operation since October, 1873. *See Bituminous Furnaces.*
- Byers, McCullough & Co., Pittsburgh. Built in 1862-3; 26 puddling furnaces, 6 heating furnaces, 1 scrap furnace, and 3 trains of rolls (one 16, one 18, and one 20-inch); also a pipe mill, to make butt-welded gas, steam and water pipe, and a galvanizing department; product, bars, plates, sheets, shafting, and skelp iron; annual capacity, 15,000 net tons.
- Cambria Iron Works, Cambria Iron Co., Johnstown, Cambria county. Office, 218 South Fourth street, Philadelphia. Built in 1853; 42 double puddling furnaces, 28 heating furnaces, 1 hammer, and the following trains of rolls: 21-inch rail mill, 5 sets; 18-inch rail mill, 2 sets; 12-inch rail mill, 3 sets; 16-inch merchant mill, 3 sets; 22-inch puddle mill, 6 sets; 21-inch puddle mill, 6 sets, and 30-inch blooming mill, 1 set. Total, 26 sets. Bessemer steel works; two 5-ton converters, and all the appliances for making steel rails. Product, iron and steel rails; total capacity per annum, 100,000 gross tons; average yearly make, 80,000 to 90,000 gross tons. E. Y. Townsend, President; Dr. Charles Stewart Wurts, Vice-President; John T. Killé, Secretary and Treasurer; D. J. Morrell, General Manager. *See Bituminous Furnaces.*
- Clinton and Millvale Rolling Mills, Graff, Bennett & Co., Pittsburgh. Built about 1841; 41 single puddling furnaces, 6 Danks puddling machines, 17 heating furnaces, 11 trains of rolls, 41 nail machines, and 1 hammer; product, bars, sheets, plates and nails; annual capacity, 20,000 net tons; average make, 20,000 tons. *See Allegheny County Furnaces.*
- Eagle Rolling Mill, Mullen & Maloney, Pittsburgh. Built in 1825; product, bar and sheet iron. Formerly owned by James Wood's Sons & Co.
- Edgar Thomson Steel Works, Edgar Thomson Steel Company, Limited, Bessemer Station, Allegheny county. Branch office, 41 Fifth Avenue,

Pittsburgh. Began operations about Sept. 1, 1875; two 5-ton converters; 3 cupolas, 40 x 5; 4 spiegel cupolas, 40 x 2; two 12-ton cupola ladles; 16 tubular boilers, 15 x 5; hydraulic lifting machinery; 20 gas producers, and 6 Siemens heating furnaces; 30-inch, 3-high blooming mill, and 23-inch, 3-high rail train; machine and smith shops attached; product, Bessemer steel rails; daily capacity, double turn, 200 gross tons ingots, and 225 gross tons double-length rails, or 200 gross tons single-length rails. First blow made on August 26, 1875, and first rail rolled on September 1, 1875. D. McCandless, Chairman; Wm. P. Shinn, Sec., Treas. and Gen. Manager; and Wm. R. Jones, General Superintendent.

Erie Rolling Mill, Erie Rolling Mill Co., Erie, Erie county. Put in operation November 1, 1874; 11 single puddling furnaces, 4 heating furnaces, and 3 trains of rolls (one 8, one 10, and one 15-inch); product, bar iron; annual capacity, 6,000 net tons.

Etna Iron Works, Limited, (Kimberly & Co., owners), New Castle, Lawrence county. Began operations Nov. 1, 1874; 2 double and 15 single puddling furnaces, 5 heating furnaces, 53 nail machines, and 4 trains of rolls (two 18, one 16, and one 8-inch); product, nails and guide iron. *See Shenango Valley Furnaces.*

Etna Rolling Mill, Spang, Chalfant & Co., Pittsburgh. Built in 1828; new mill added in 1873-4; old mill has 24 single puddling furnaces, 9 heating furnaces, and 4 trains of rolls (one 8, one 12, one 16, and one 18-inch); new mill has 5 Siemens puddling furnaces, 1 Siemens heating furnace, and 2 trains of rolls; product, sheets, plates, rods, and tubing.

Fort Pitt Iron and Steel Works, Reese, Graff & Woods, Pittsburgh. Organized in 1862; 22 puddling furnaces, 15 heating furnaces, 7 hammers, 1 fusing disc, two 24-pot Siemens steel-melting furnaces, 4 shingle-strip machines, 2 horse-shoe machines, and 7 trains of rolls (22-inch muck train, 22-inch sheet-steel train, 12-inch steel train, 9-inch steel train, 16-inch bar, 8-inch guide, and 8-inch hoop); also a spring factory, with full set of machinery for making spiral springs for railroad cars; product, plates, sheets, guide iron, bar iron, light T rails, and German and cast steel; annual capacity, 12,000 net tons merchant iron, 1,000 tons tool steel, and 4,000 tons of special steel, German steel, and iron-centre cast steel for agricultural purposes.

Glendon Rolling Mill, Dilworth, Porter & Co., Pittsburgh. Built in 1857; 24 single puddling furnaces, 4 heating furnaces, 9 railroad spike machines, and 5 trains of rolls (two 8, one 10, and two 16-inch); product, railroad and marine spikes, railroad chairs, and fish bars and bolts; annual capacity, 10,500 net tons; average make, 8,000 tons.

Greenville Rolling Mill, Greenville, Mercer county. Built in 1871; 2

double and 5 single puddling furnaces, 2 heating furnaces, and 3 trains of rolls (one 8, and two 16-inch); product, bar and hoop iron, principally hoop; annual capacity, 5,000 net tons.

Iron City and Siberian Iron Works, Rogers & Burchfield, Pittsburgh. Iron City Mill at Apollo, Armstrong county, built in 1850; 9 single puddling furnaces, 5 heating furnaces, and 6 trains of rolls. Siberian Mill at Leechburgh, Armstrong county, built in 1872; 6 single puddling furnaces, 6 heating furnaces, 6 trains of rolls, 2 steam hammers, 1 refinery, and 2 knobbling fires; this mill is run with gas for fuel from a well 1,200 feet deep, furnishing all the fuel required for puddling, heating, and making steam. Product, tin plates, sheet iron and charcoal terne plates; annual capacity, 6,000 net tons; average make, 5,500 tons.

Juniata Iron Works, Shoenberger & Co., Pittsburgh. Built in 1824 and 1857; 29 single puddling furnaces, 8 heating furnaces, 1 annealing furnace for sheet iron, 1 pair heating furnaces for sheet iron, 6 furnaces for heating nail plates, 1 furnace for annealing nails, 8 hammers, and 6 trains of rolls (2 trains muck, one 16-inch bar, one 8-inch bar, one sheet train, and one nail-plate train), and 92 nail machines; product, nails, sheet and plate iron, horse and mule shoes, and horse-shoe bar; annual capacity, 18,000 net tons.

Kensington Rolling Mill, H. Lloyd, Son & Co., Pittsburgh. Built in 1828; 16 single puddling furnaces, 6 heating furnaces, and 4 trains of rolls; product, bar, sheet, and plate iron, flat rails, and T rails from 12 to 30 lbs. to the yard; annual capacity, 6,000 net tons; average yearly production, 5,000 tons.

Keystone Iron Works, Glass, Neely & Co., Pittsburgh. Built in 1865; 19 single puddling furnaces, 1 scrap and 5 heating furnaces, and 4 trains of rolls; product, all sizes round, square, and flat bar iron, hoop, plate, and sheet iron; annual capacity, 11,000 net tons.

McKeesport Iron Works, Wm. D. Wood & Co., Pittsburgh. Works at McKeesport, Allegheny county. Built in 1851; 10 forge fires, 7 single puddling furnaces, 16 heating furnaces, 4 trains of rolls, and 4 hammers; product, sheet iron, both common American and planished in imitation of Russian; annual capacity, 4,000 net tons; average make, 3,500 tons.

Middlesex Rolling Mill Co., Middlesex, Mercer county. Works put in operation June 1, 1873; 10 single puddling furnaces, 1 heating furnace, and 2 trains of rolls (one 10 and one 18-inch); product, merchant bar iron; annual capacity, 5,000 net tons. H. C. Jones, President.

Newcastle Iron Works, Bradley, Reis & Co., New Castle, Lawrence county. Built in 1873; 10 single puddling furnaces, 5 heating furnaces, 3 trains

of rolls, and 1 hammer; product, light and heavy sheet iron, from hammered blooms; annual capacity, 6,000 net tons; average annual make, 5,000 tons.

Old Fort Iron Works, Jacobs & Jackson, Brownsville, Fayette county. Completed December 1, 1873; 6 single puddling furnaces, 3 heating furnaces, 2 trains of rolls, 2 spike and bolt machines, 2 hammers, and 1 squeezer; product, bar iron, light T rails, car axles, and general forgings, spikes and bolts; yearly capacity, 9,000 net tons.

Ormsby Iron Works, Wharton, Brothers & Co., Pittsburgh. Built in 1863; 20 puddling furnaces, 5 heating furnaces, and 4 trains of rolls (one 8, one 10, and two 16-inch); product, bar, rod, guide, and hoop iron; annual capacity, 14,000 net tons. Paul Jones, Assignee.

Pennsylvania Iron Works, Everson, Macrum & Co., Pittsburgh. Built in 1844; 14 puddling furnaces, 8 heating furnaces, and 5 trains of rolls (2 sheet, 1 bar, 1 guide, and 1 muck train); product, bar, sheet, and guide mill iron; annual capacity, 6,000 net tons; average annual make, 4,000 tons. *See Scottdale Rolling Mill.*

Pittsburgh Bolt Works, Pittsburgh Bolt Co., Pittsburgh. 24 single puddling furnaces, 7 heating furnaces, and 6 trains of rolls (one 8, one 10, and four 18-inch); product, nuts, bolts, and railroad supplies; annual capacity, 15,000 net tons. E. Kaylor, President, and H. F. Lynch, Secretary. In hands of assignees.

Pittsburgh Forge and Iron Co., Pittsburgh. Built in 1864; 15 single puddling furnaces, 7 heating furnaces, 3 trains of rolls, and 3 hammers; product (1) bar, rod, band, hoop, oval and half oval iron, fish plates, and track bolts, and (2) hammered car and locomotive axles, railroad, steamboat and machine forgings; capacity yearly, (1) 13,000 net tons, (2) 2,000 tons; average yearly production, (1) 8,500 tons, (2) 1,500 tons. W. W. Speer, President, and Jas. H. Murdoch, Secretary and Treasurer.

Pittsburgh Iron Works, Jacob Painter & Sons, Pittsburgh. Built in 1833; 52 single puddling furnaces, 15 heating furnaces, and 13 trains of rolls (six 8-inch, three 10, one 12, one 16, and two 20-inch); product, principally oil, whisky, and trunk hoops, also hoops for pails, tubs, and wooden ware, cotton ties, lock iron, stone saws, merchant bands, and hinge iron; annual capacity, 24,000 net tons; average yearly production, 22,000 tons.

Sable Iron and Nail Works, Zug & Co., Pittsburgh. Built in 1845; 34 single puddling furnaces, 11 heating furnaces, 6 trains of rolls, and 55 nail machines; product, merchant bar iron, including heavy sizes flat bars and squares made by the "universal" rolls, and nails; annual capacity, 18,000 net tons.

Scottdale Rolling Mill, Everson, Macrum & Co., Pittsburgh. Works at

Scottdale, Westmoreland county. Built in 1873; 11 single puddling furnaces, 4 heating furnaces, and 3 trains of rolls; product, muck bar and sheet iron; annual capacity, 5,000 net tons; average annual make, 4,000 net tons. *See Pennsylvania Iron Works.*

Sharon Rolling Mills, Westerman Iron Co., Sharon, Mercer county. Built in 1862; 29 single puddling furnaces, 12 heating furnaces, 7 trains of rolls, and 46 nail machines; product, bar, hoop, and sheet iron, railroad and boat spikes, light T rails and nails; annual capacity, 15,000 net tons. *See Shenango Valley Furnaces.*

Shenango Iron Works, Reis, Brown & Berger, New Castle, Lawrence county. Built in 1848; 27 single puddling furnaces, 9 heating furnaces, 5 trains of rolls, and 55 nail machines; product, bars, light T rails, sheets, bands, wrought spikes, and nails; annual capacity, 15,000 net tons; average yearly make, 12,000 tons. *See Shenango Valley Furnaces.*

Sligo Iron Works, Phillips, Nimick & Co., Pittsburgh. Built in 1825; 27 puddling furnaces, 10 heating furnaces, 2 hammers, and 5 trains of rolls (one 12, one 16, one 18, one 24, and one 30-inch); product, bar, sheet, and plate iron, light T rails, and puddled steel; fire-box iron a specialty; make "Sligo" bars, and "Tyrone" refined iron; annual capacity, 16,000 net tons.

Soho Iron Mills, Moorhead & Co., Pittsburgh. Built in 1859; 12 knobbling fires, 11 single puddling furnaces, 6 heating furnaces, 4 sheet furnaces, 3 pair furnaces, 5 trains of rolls (1 muck, and 4 sheet trains), and 1 hammer; product, sheet and plate iron; annual capacity, 10,000 net tons; average make, 7,200 tons.

Solar Iron Works, Wm. Clark & Co., Pittsburgh. Built in 1869; 17 single puddling furnaces, 5 heating furnaces, and 5 trains of rolls (one 7, two 8, one 12, and one 18-inch), product, hoop, band, and scroll iron; annual capacity, 6,000 net tons.

Star Iron Works, Lindsay & McCutcheon, Allegheny City, Allegheny county. Built in 1862; 14 puddling furnaces, 4 heating furnaces, and 4 trains of rolls; product, hoop iron of all sizes; annual capacity, 8,000 net tons.

Stewart Iron Works, Stewart Iron Co., Sharon, Mercer county. Built in 1870; 16 single puddling furnaces, 1 hammer, and 2 trains of 18-inch rolls; product, muck bar and blooms; annual capacity, 9,000 net tons. David Stewart, 119 Broadway, New York City, President; Fayette Brown, Cleveland, O., General Agent; Theo. F. Hicks, Secretary, New York City; G. P. Lloyd, Treasurer, New York City; and Thos. E. Blunt, Manager. *See Shenango Valley Furnaces.*

Superior Rolling Mill, Harbaugh, Mathias & Owens, Pittsburgh. Built in 1865; product, rails. In hands of assignees. *See Allegheny County Furnaces.*

- Union Forge and Iron Mills, Wilson, Walker & Co., Pittsburgh. Built in 1862; 15 single puddling furnaces, 6 heating furnaces, 4 hammers, and 5 trains of rolls (one 18, one 15, and one 10-inch, and 2 "universal" plate trains); product, railroad specialties and bridge work, angles, and peculiar shapes, and bar iron; annual capacity, 9,000 net tons.
- Union Iron Mills, Carnegie Brothers & Co., Pittsburgh. Built in 1862; 21 single puddling furnaces, 10 heating furnaces, 7 trains of rolls, and 1 hammer; product, beams, channels, tees, angles, plates, and bar iron; annual capacity, 27,000 net tons.
- United States Iron and Tin Plate Works, U. S. Iron & Tin Plate Co., 124 First Avenue, Pittsburgh. Works at McKeesport, Allegheny county. Built in 1873-4; 3 double puddling and 2 heating furnaces, 4 knobbling fires, 2 double sheet-mill furnaces, 2 annealing furnaces, 3 tinning stacks in operation and 1 in course of erection, 1 hammer, and 1 train of bar rolls, 2 trains of sheet rolls, and 3 sets of cold rolls; product, tin and terne plates, and odd sizes of common and charcoal polished black plates; specialty, stamping iron and show-card iron. J. H. Demmler, President; H. H. Demmler, Treasurer; W. C. Cronmeyer, Secretary, and John Coles, Superintendent.
- Valley Rolling Mill, Colwell, Mosgrove & Co., Kittanning, Armstrong county. Built in 1848; 16 single puddling furnaces, 5 heating furnaces, 3 trains of rolls, 22 nail machines, and 1 squeezer; product, rod and sheet iron, nails, and spikes; annual capacity, 7,000 net tons. Idle since March, 1873.
- Vesuvius Iron Works, Lewis, Dalzell & Co., Pittsburgh. Built in 1846; 24 single puddling furnaces, 10 heating furnaces, 6 trains of rolls, and 50 nail machines; product, bar, sheet and tank iron, rods, hoops, and nails; annual capacity, 12,000 net tons.
- Wayne Iron and Steel Works, Brown & Co., Pittsburgh. Built in 1829; 28 puddling furnaces, 4 heating furnaces, 5 trains of rolls, 2 steam hammers, 24 steel-melting holes, and two 45-ton converting furnaces; product: Iron—bars, rods, hoops, sheets, light T rails, splice bars, boiler plate and rivets. Steel—cast, German, and "U. S." refined. Annual capacity, 10,000 net tons of iron, and 3,500 net tons of steel.
- Wheatland Rolling Mills, Trustees of J. T. and C. A. Wood, Wheatland, Mercer county. Built in 1872; 12 double puddling furnaces, 14 heating furnaces, and 3 trains of rolls; product, rails, bars, and sheet iron; annual capacity, 45,000 net tons; average yearly production, 30,000 tons. Not in operation in 1875. To be sold at public sale, Jan. 13, 1876, by the Trustees, R. J. Anderson, John J. Spearman, and H. W. Oliver, Jr., whose office is now at 114 Wood st., Pittsburgh.
- Number of mills in Pittsburgh and Allegheny county: 31. Total number

of mills in Western Pennsylvania : 47. Of these, 13 roll rails, 8 only making light rails. Total number of mills in Pennsylvania : 137. Of these, 34 roll rails, 14 only making light rails, and 1 only street rails.

DELAWARE.

Christiana Iron Co., Wilmington, New Castle county. Built in 1873-4; 2 double puddling furnaces, 2 heating furnaces, 2 trains of rolls, and 1 hammer; product, boiler plate, flue, ship, and tank iron. Geo. G. Lobdell, President, and Jno. W. Huxley, Secretary and Treasurer.

Delaware Iron Works, Alan Wood, Wooddale, near Wilmington. Office, 519 Arch street, Philadelphia. Built in 1812; 1 20-inch train of rolls; water-power; product, sheet iron; annual capacity, 550 net tons. *See Schuylkill Iron Works, Eastern Pennsylvania.*

Diamond State Iron Works, Diamond State Iron Co., Wilmington. New York office, 71 Broadway. Built in 1853; 3 double and 3 single puddling furnaces, 1 scrap furnace, 4 heating furnaces, and 4 trains of rolls (one 8, one 10, and two 18-inch); product, merchant bar iron, fish plates, railroad spikes, bolts and nuts, and bridge bolts; annual capacity, 11,000 net tons; average yearly production, 8,000 tons. H. Mendinhal, President; Clement B. Smyth, Vice-President and Treasurer, and George W. Todd, Secretary.

Edge Moor Iron Works, Wilmington. Begun in 1873; not yet completed. Wm. Sellers, President, and George Sellers, Manager.

Marshallton and Newport Iron Works, J. Marshall & Co., Newport, New Castle county. Built in 1836 and 1873, respectively; 3 single puddling furnaces, 1 puddling machine, 1 heating furnace, and 4 trains of rolls; water and steam power; product, bar and sheet iron; annual capacity, 2,000 net tons; average yearly production, 1,800 tons.

McCullough Iron Co., Wilmington. Office, Sixteenth street and Washington avenue, Philadelphia. Built in 1873-4; product, sheet iron. *See Maryland Rolling Mills.*

New Castle Rolling Mill, Corbin & Goodrich, New Castle, New Castle county. Office, 430 Walnut street, Philadelphia. Removed from Bristol, Pa., and rebuilt at New Castle, and enlarged in 1874-5; 3 double puddling furnaces, 2 heating furnaces, 1 train of rolls (comprising 1 set of bar rolls, and 3 sets of skelp rolls), and 1 hammer; product, bar and skelp iron; annual capacity, 4,500 net tons.

Wilmington Plate Iron Rolling Mills, Seidel & Hastings, Wilmington. First mill built in 1845, second in 1870; another mill, for tops and bottoms only, with a train of rolls, 17 in. x 48 in., was built in 1875; 5 forge fires (equal to 6 puddling furnaces), 4 heating furnaces, 3 trains of rolls, and 3 hammers; product, boiler, ship, and tank iron; annual

capacity, 5,000 net tons; average yearly production, single turn, 4,000 tons.

Wilmington Rolling Mills, B. F. Townsend, Wilmington. Built in 1868; 4 single puddling furnaces, 2 heating furnaces, 1 puddle mill, one 8½-inch bar mill, and 1 rotary squeezer; product, all kinds of bar iron; annual capacity, 3,000 net tons; average annual make, 2,400 tons. Number of mills in Delaware: 8 completed mills and 1 building.

MARYLAND.

Abbott Iron Works, Abbott Iron Co., P. O. Box 185, Baltimore. (1) Plate mills, built in 1851, have 6 double puddling and 8 heating furnaces, 1 hammer, and 5 trains of rolls; 2 sets Lauth's patent 3-high plate rolls, with facilities for rolling plate to 100 inches in width, and girder plates 40 feet in length. (2) Rail mill, built in 1865, has 17 double puddling and 10 heating furnaces, 3 trains of rolls, and 1 hammer. Product (1), boiler, tank, boat, still, car, and bridge plates; annual capacity, 10,000 net tons, and average annual make, 5,500 tons. Product (2), iron rails; annual capacity, 25,000 net tons, and average annual make, 15,000 tons. Charles H. Ashburner, President; J. S. Gilman, Vice-President, and C. W. Morris, Secretary.

Baltimore Steam Forge and Rolling Mill, Trego, Thompson & Co., Baltimore. Built in 1853; 4 double puddling and 3 heating furnaces, 1 train of rolls, and 2 hammers; product, bar iron and car axles; annual capacity, 3,000 net tons; average annual make, 2,600 tons.

Cumberland Rolling Mill, Baltimore and Ohio Railroad Co., Cumberland, Alleghany county. Rail mill built in 1870; 1 single and 13 double puddling furnaces, 16 heating furnaces, 3 trains of rolls, and 3 hammers; product, rails and axles; annual capacity, 33,000 net tons. Bar mill built in 1873; 4 single puddling furnaces, 6 heating furnaces, and 3 trains of rolls; product, bar, bridge, and all sizes guide iron; annual capacity, 8,000 tons.

Locust Point Rolling Mill, Coates & Brother, Baltimore. Built in 1862; 4 double puddling furnaces, 3 heating furnaces, 2 trains of rolls, and 1 hammer; product, plate and flue iron; annual capacity, 4,500 net tons; average yearly production, 3,000 tons.

McCullough Iron Co., 16th street and Washington avenue, Philadelphia: Northeast Iron Works, and West Amwell Iron Works, near Elkton, and Octoraro Iron Works, Rowlandville, all in Cecil county. Three mills, all owned by the same Company. Northeast and West Amwell mills were built in 1847; 10 single puddling furnaces, 10 heating furnaces, 6 trains of rolls, and 1 hammer; water and steam power; product, blooms for galvanizing, and boiled iron of the kind called

"Harvey's patent cleaned;" annual capacity, 7,000 net tons; average yearly production, 6,000 tons. A bloomary of 8 fires is at the same place, also owned by this Company. Octoraro mill was built in 1829; 4 heating furnaces for making sheet iron, and 4 trains of rolls; water power; product, sheet iron, from No. 12 to 28, inclusive; annual capacity, 2,500 net tons; average yearly production, 2,000 tons. The muck bar used at Octoraro mill comes from the other mills. *See Delaware Rolling Mills.*

Number of mills in Maryland: 5. Of these, 2 roll rails.

VIRGINIA.

Graham's Forge, Graham & Robinson, Graham's Forge, Wythe county. Built in 1828; 3 heating furnaces, 4 trains of rolls, 5 nail machines, and 1 hammer; water-power; product, nails, and horse-shoe, tire and plate iron, blooms, and hammered iron; annual capacity, 300 net tons of blooms, 600 tons rolled iron, and 300 tons nails, but no nails have been made for some time. *See Furnaces. See Bloomaries.*

Lynchburg Iron Works, David Richards & Co., Lynchburg, Campbell county. Built in 1846; 1 puddling furnace, 2 heating furnaces, 3 spike furnaces, 3 spike machines, and 2 trains of rolls (one 8, and one 10-inch); product, merchant iron, railroad and boat spikes, fish bars and bolts. After standing for two years, this mill was started in the summer of 1875.

Old Dominion Iron and Nail Works, Richmond. Works at Belle Isle, Henrico county. Improved and enlarged since 1865; 5 double and 10 single puddling furnaces, 5 heating furnaces, 4 trains of rolls, 76 nail machines, and 1 hammer; water-power; product, nails, bar and band iron; annual capacity, nails, 7,500 net tons, rolled iron, 3,360 tons. R. E. Blankenship, Commercial Agent.

Tredegear Iron Works, Tredegear Company, Richmond. Built in 1837; 1 double and 23 single puddling furnaces, 16 heating furnaces, and 6 trains of rolls; water-power; product, merchant bar iron, railroad axles, bridge iron, fish plates, spikes, chairs, track bolts, and horse-shoes; annual capacity, 34,000 net tons; average make for last 5 years, 18,000 tons. *See Furnaces.*

Number of mills in Virginia: 4.

GEORGIA.

Rome Iron Works, Rome Iron Manufacturing Co., Rome, Floyd county. One single and 2 double puddling furnaces, 3 heating furnaces, 3 trains of rolls, 20 nail machines, 1 spike machine, 1 railroad spike machine, and 2 shears; product, light T rails, bar iron, nails and spikes; an-

nual capacity, nails, 2,000 net tons; spikes, 1,000 tons; bar iron, 3,500 tons.

Scofield Rolling Mill, Scofield Rolling Mill Co., Atlanta, Fulton county.

Built in 1859; 4 double puddling furnaces, 7 heating furnaces, 5 trains of rolls, 6 shears, 1 bolt machine, 1 spike machine, and 2 squeezers; steam-power, supplied by 7 engines of 450-horse power; product, (1) rails, (2) merchant and bar iron, (3) fish bars, bolts and nuts, and spikes; annual capacity, (1) 15,000 net tons, (2) 1,500 tons, and (3) 500 tons; average make, (1) 7,500 tons, (2) 600 tons, and (3) 400 tons. L. Scofield, President and Manager.

Number of mills in Georgia: 2, both rail mills, one making light rails only.

ALABAMA.

Central Iron Works, Fell & Co., Helena, Shelby county. Put in operation in March, 1873; 4 single puddling furnaces, 2 heating furnaces, and 2 trains of rolls; product, bar iron; cotton ties a specialty; annual capacity, 1,000 net tons.

Number of mills in Alabama: 1.

WEST VIRGINIA.

Belmont Nail Works, Belmont Nail Works Co., Wheeling, Ohio county.

Built in 1849; 23 single puddling furnaces, 4 heating furnaces, 3 trains of rolls, 110 nail machines, and 1 squeezer; product, nails exclusively; annual capacity, 12,500 net tons; average annual production, 10,000 tons. Henry Moore, President, and J. D. DuBois, Vice-President and Treasurer. *See Furnaces.*

Benwood Iron Works, Wheeling. Built in 1852; 21 single puddling furnaces, 4 heating furnaces, 2 trains of rolls, and 112 nail machines; product, nails exclusively; annual capacity, 13,750 net tons; average yearly production, 10,000 tons. Alexander Laughlin, President; L. S. Delaplain, Vice-President, and Alonzo Loring, Secretary. *See Miscellaneous Bituminous Furnaces in Ohio.*

Clifton Iron and Nail Co., Middleport, Meigs county, Ohio. Works at Clifton, Mason county, West Virginia. Built in 1867; 14 single puddling furnaces, 3 heating furnaces, 1 train of rolls, and 40 nail machines; product, nails exclusively; annual capacity, 4,500 net tons; average yearly production, 3,500 tons.

Crescent Iron Works, Whitaker Iron Co., Wheeling. Built in 1855; 15 double puddling furnaces, 16 heating furnaces, and 5 trains of rolls; product, light and heavy T rails, sheet and fire-bed iron, spikes, and splice bars; annual capacity, 38,000 net tons. George P. Whitaker, President, Principio, Md.; N. E. Whitaker, Secretary.

La Belle Nail Works, Bailey, Woodward & Co., Wheeling. Built in 1852; 22 single puddling furnaces, 3 heating furnaces, 2 trains of rolls, and 84 nail machines; product, nails and spikes exclusively; annual capacity, 10,000 net tons; average yearly production, 8,500 tons.

Ohio Valley Iron Works, Ohio Valley Iron Co., Moundsville, Marshall county. Put in operation March 1, 1874; 8 single puddling furnaces, 2 heating furnaces, and 3 trains of rolls (one 8, one 16, and one 19-inch); product, merchant bar of all sizes; specialty, hoop iron; annual capacity, 5,500 net tons. J. W. Gallaher, President; J. T. Frissell, Secretary, and H. D. Whipple, Superintendent.

Riverside Iron Works, Wheeling. Built in 1854, and since enlarged; 37 single puddling furnaces (13 of these being in the Washington Mill, leased and operated by the Works), 6 heating furnaces, 126 nail machines, and 3 trains of rolls (one 8, one 12, and one 21-inch); product, bar iron, light T rails, railroad spikes, and nails; annual capacity, 20,000 net tons. Part of the mill was burnt and rebuilt in 1875. J. N. Vance, President; John D. Culbertson, Treasurer, and N. Wilkinson, Secretary. *See Furnaces.*

Wheeling Iron Works, Wheeling Iron and Nail Co., Wheeling. Built in 1867, and rebuilt in 1872; 26 single puddling furnaces, 4 heating furnaces, 106 nail machines, double muck train, and 1 nail-plate train of rolls; product, nails; annual capacity, 12,000 net tons; average make, 10,000 tons. *See Furnaces.*

Number of mills in West Virginia: 8. Of these, 2 roll rails, 1 making only light rails.

KENTUCKY.

Anchor Iron and Steel Works, Anchor Iron and Steel Co., Cincinnati, Ohio. Works at Newport, Campbell county, Ky., formerly owned by Gaylord Iron and Pipe Co. Rebuilt and fitted with new machinery in 1874; 6 single puddling furnaces, 3 heating furnaces, 3 hammers, and 3 trains of rolls (one 10, one 18, and one 20-inch); product, bar, sheet, and plate iron, and car axles; annual capacity, 6,000 net tons.

Covington Rail Mill, James G. Kyle & Bro. Office, 33 West Third street, Cincinnati, Ohio. Works at Covington, Kenton county, Ky. Built in 1854; 9 single puddling furnaces, 7 heating furnaces, 1 hammer, and 3 19-inch trains of rolls; product, T rails from 30 to 63 lbs., and street rails from 33 to 45 lbs.; annual capacity, 15,000 net tons.

Licking Iron Works, Phillips and Jordan Iron Co., Cincinnati, Ohio. Works at Covington, Ky. Built in 1845; 1 single and 5 double puddling furnaces, 7 heating furnaces, 1 hammer, and 6 trains of rolls (one 16-inch muck, one 16-inch bar, one 8-inch guide, one 6-inch guide,

one 22-inch boiler plate, and one 20-inch sheet); product, merchant bar, bridge, boiler, and sheet iron, rivets, angle, and tee iron, jail, sash, and corrugated-roofing iron, railroad spikes, fish-plates, and handmade chains; annual capacity, 7,000 net tons; average make, 6,000 tons.

Louisville Rolling Mill, Louisville Rolling Mill Co., Louisville. Organized in 1849; 20 single puddling furnaces, 1 scrap furnace, 5 heating furnaces, 1 hammer, and 5 trains of rolls (two 8, one 16, one 18, and one 22-inch); product, bar, sheet, plate, small T rails, hoops, bands, small rounds, squares, and flats, nails, steel, and horse shoes; annual capacity, 9,000 net tons, single turn. *See Kentucky Rolling Mill.*

Kentucky Rolling Mill, consolidated with the Louisville Rolling Mill in 1875. Built in 1869; 13 puddling furnaces, 1 scrap, and 3 heating furnaces; one 18-inch forge mill, 2 pairs rolls and Burden squeezer; one 12-inch, 3-high bar mill; and one 8-inch, 3-high guide mill; product, bar, band, hoop, and horse-shoe iron; light T rails, from 10 to 40 lbs., for narrow gauge roads, mines, etc., and tram rails, from 20 to 45 lbs., for street railways, a specialty; annual capacity, 6,000 net tons, single turn. T. C. Coleman, President; Barry Coleman, Vice-President; J. Morgan Coleman, General Superintendent, and W. P. Coleman, Superintendent. *See Louisville Rolling Mill.*

Norton Iron Works, Ashland, Boyd county. Put in operation in March, 1875; 10 double and 20 single puddling furnaces, 3 heating furnaces, 80 nail machines, and 2 trains of rolls (one 20, and one 22-inch); product, nails; annual capacity, 10,000 net tons; average annual make, 8,000 tons. M. R. Tewksbury, President; John Russell, Vice-President and Secretary; Hugh Means, Treasurer, and Madison Maines, Manager. *See Furnaces.*

Ohio Valley Steel and Iron Works, Mitchell, Tranter & Co., 52 West Second street, Cincinnati, Ohio. Works at Covington, Ky. Built in 1873; 10 puddling, 2 scrap, 2 slab, and 2 plate-mill furnaces, 2 annealing and 4 heating furnaces, and 6 trains of rolls; product, plate, channel, angle, and merchant iron, boiler plate, and plow steel; annual capacity, 12,000 net tons.

Paducah Iron Co., Paducah, McCracken county. Built in 1854; 4 double and 5 single puddling furnaces, 4 heating furnaces, and 5 trains of rolls; product, bar, hoop, sheet, and boiler iron; annual capacity, 5,000 net tons; average make, 3,500 tons. Sometimes called Gates, Brown & Co.'s mill, and sometimes Harris, Brown & Co.'s.

Swift's Iron and Steel Works, Cincinnati, Ohio. Works at Newport, Campbell county, Ky. Built in 1857; 31 single puddling and 14 heating furnaces, 4 knobbling fires, 10 steel-melting holes, and 8 trains of rolls (8, 10, and 18-inch bar trains, 2 forge, 1 sheet, and 2 plate trains); prod-

uct, boiler and common plate, light and heavy sheet, merchant bar, shaped irons, light T and street rails, and steel safe and plow plate; annual capacity, 30,000 net tons; average make, 12,000 tons. Alexander Swift, President; Geo. E. Clymer, Vice-President and Treasurer; and L. T. Hubbard, Secretary and Manager. *See Furnaces.*

Tennessee Rolling Works, D. Hillman & Sons, Empire Iron Works, Trigg county. Branch office at Nashville, Tennessee. Built in 1846; 7 single puddling furnaces, 12 knobbling fires, 6 heating furnaces, 2 hammers, and 5 trains of rolls (8-inch guide, 10 and 18-inch bar, and 20 and 26-inch plate trains); product, boiler plate, sheet iron, bar and rod iron, and blooms; annual capacity, 4,000 net tons; average annual make, 2,000 tons. *See Furnaces.*

Number of mills in Kentucky: 10. Of these, 4 roll rails, 3 making only light T and street rails.

TENNESSEE.

Knoxville Iron Co., Knoxville, Knox county. Built in 1865; 4 single puddling furnaces, 1 heating furnace, 12 nail machines, and 2 trains of rolls (8 and 15-inch); product, merchant bar and nails; annual capacity, 2,400 net tons.

Memphis Rolling Mill, R. C. Daniel, Memphis, Shelby county. Built in 1866; 1 double and 1 single puddling furnace, 2 heating furnaces, and 2 trains of rolls (one 9 and one 16-inch); product, all sizes merchant bar, plow slabs, fish bars, and street rails; annual capacity, 5,000 net tons; average make, 2,000 tons.

Roane Iron Works, Roane Iron Co., Chattanooga, Hamilton county. Rolling mill built in 1864; puddle mill built in 1869; 7 double puddling furnaces, 1 Danks puddling machine, 10 heating furnaces, 1 hammer, and 3 trains of rolls (two 18, and one 20½-inch); product, rails; annual capacity, 28,000 net tons. W. P. Rathburn, President; H. S. Chamberlain, Vice-President and General Manager, and H. Clay Evans, Secretary. C. Constable, Manager of Furnaces, Rockwood, Roane county. *See Furnaces.*

Vulcan Works, Chattanooga. Built in 1866; 8 single puddling furnaces, 5 heating furnaces, 1 hammer, and 3 trains of rolls (one 8, and two 18-inch); product, merchant bar, light T rails, car axles, splice bars, and bolts; annual capacity, 6,000 net tons.

Number of mills in Tennessee: 4. Of these, 3 roll rails, 2 making only light T and street rails.

OHIO.

LAKE COUNTIES.

American Sheet and Boiler Plate Co., Cleveland Rolling Mill Co. lessees,

Cleveland, Cuyahoga county. Built in 1868; 8 charcoal knobbling fires, 7 single puddling furnaces, 1 puddling machine, 5 heating furnaces, 4 trains of rolls, and 2 hammers; product, iron and steel boiler plate, "universal" rolled bar and plate, Juniata charcoal and common sheet iron and galvanized sheet, and agricultural steel; annual capacity, 4,000 net tons plates and 2,000 tons sheets; average yearly production, 3,250 tons plates and 1,500 tons sheets. *See Cleveland Rolling Mill Co.*

Ashtabula Rolling Mill Co., Ashtabula, Ashtabula county. Built in 1873-4; 3 single puddling furnaces, 5 heating furnaces, 1 scrap furnace, 2 trains of rolls (20 x 84, and 21 x 44), 2 spike machines, 2 washer machines, and 2 shingle-band machines; product, sheet iron, boiler plate, shingle bands, washers, and wrought spikes; annual capacity, 2,500 net tons. A. Dienst, Secretary, and Geo. Harris, Superintendent.

Cleveland Iron Works, Cleveland Iron Co., Cleveland. Built in 1863; 19 single puddling furnaces, 11 heating furnaces, 5 trains of rolls, and 1 hammer; product, rails, bar iron, splice bars, spikes, and bolts; annual capacity, 40,000 net tons; average yearly production, 22,000 tons. Wm. Bingham, President; James Barnett, Vice-President, and S. A. Fuller, Secretary and Treasurer. *See Furnaces.*

Cleveland Rolling Mill Co., Cleveland. Two mills: Lake Shore Mills, at Cleveland, built in 1852; and Newburgh Mills, at Newburgh, 6 miles distant, built in 1857; Bessemer steel works, at Newburgh, contain four 5-ton converters, and all the appliances for making steel rails; product, steel and iron rails, bar iron, hoops, steel tire, wire, forgings, spring steel, railroad frogs, crossings, etc.; annual capacity, steel rails, 22,000 net tons; iron rails, 20,000; bar iron, hoops, etc., 10,000; wire, 5,000, and forgings, 1,000 net tons. A. B. Stone, President, 64 Wall st., New York; H. Chisholm, Vice-President and General Manager, Cleveland; S. C. Baldwin, Treasurer and General Agent, and E. S. Page, Secretary. *See American Sheet and Boiler Plate Company. See Furnaces.*

Lake Erie Iron Works, Lake Erie Iron Co., Cleveland. Built in 1852; 7 single and 3 double puddling furnaces, 4 scrap and 9 heating furnaces, 4 trains of rolls, and 9 hammers; product, steel axles, fagoted car and locomotive axles, iron and steel forgings of every description, and merchant bar iron; annual capacity, 12,000 net tons; average yearly production, 10,000 tons. W. C. Scofield, President; E. Lewis, Vice-President; C. W. Scofield, Secretary and Treasurer, and James E. Lewis, Superintendent.

Nes Silicon Steel Works, Nes Silicon Steel Co., Sandusky, Erie county. Put in operation in October, 1873; 6 single puddling furnaces, 8 heating furnaces, 1 hammer, and 6 trains of rolls (3-high, one 7 and two 18-inch trains; and, 2-high, 1 old-rail and 2 puddle trains); product, railroad bars of iron or steel, and blooms; annual capacity, 30,000 net tons.

Standard Iron Co., Cleveland. Built in 1851; 7 single puddling and 6 knobbling furnaces, 3 heating furnaces, 4 trains of rolls, and 1 hammer; product, black and galvanized sheet iron; also make coal hods; annual capacity, 4,000 net tons; average annual production, 2,800 tons. A. B. Hough, President; C. H. Tucker, Vice-President and Manager, and C. L. Rhodes, Secretary and Treasurer. Formerly Cleveland Boiler Plate Manufacturing Co.

Union Iron Works, Union Iron Works Co., Cleveland. 30 puddling and 7 heating furnaces, 6 trains of rolls, and 2 squeezers; product, nuts, bolts, guide and bar iron, and light T and street rails; annual capacity, 25,000 net tons. M. Hill, President. *See Furnaces.*

Valley Iron Co., Cleveland. Built in 1874-5; 1 double puddling furnace; 1 scrap furnace, 1 finishing furnace, 1 hammer, and 2 trains of rolls (one 9 and one 14-inch); product, merchant bar. W. J. Harrison, President; John Gawne, Vice-President; Chas. T. Reeves, Treasurer; W. J. Gawne, Secretary, and James Stevenson, Superintendent.

Number of mills in the Lake region: 9. Of these 4 roll rails, 1 making only light T rails.

MAHONING VALLEY.

Akron Iron Works, Akron Iron Co., Akron, Summit county. Built in 1866; 17 single puddling furnaces, 1 scrap furnace, 4 heating furnaces, and 3 trains of rolls; product, all kinds of bar iron, and light T rails from 10 to 30 lbs. per yard; specialty, iron for agricultural implements; annual capacity, 6,500 net tons; average make, 5,500 tons. L. Miller, President; J. A. Long, Secretary, and Joseph Carns, Manager. *See Mahoning Valley Furnaces.*

Enterprise Iron Works, Cartwright, McCurdy & Co., Youngstown, Mahoning county. Built in 1863 and 1874; 30 single puddling furnaces, 9 heating furnaces, and 8 trains of rolls (one 6, one 7, two 8, one 10, one 16, and two 18-inch); product, hoop and band iron, and steel-mixed carriage tire; annual capacity, 10,000 net tons; average make, 6,000 tons.

Falcon Iron and Nail Works, Falcon Iron and Nail Co., Niles, Trumbull county. Built in 1867; 12 single puddling and 3 heating furnaces, 44 nail machines, and 3 trains of rolls (one 8, one 18, and one 21-inch); product, nails and guide iron; annual capacity, 11,000 net tons. Formerly part of the works of James Ward & Co. William Ward, President; T. K. Hall, Vice-President, and A. M. Robbins, Secretary and Treasurer.

Girard Rolling Mill, Girard Rolling Mill Co., Girard, Trumbull county. Put in operation September 1, 1873; 13 single puddling furnaces, 2 heating furnaces, and 3 trains of rolls; product, all sizes of merchant

bar, and a specialty of 8 and 12-lb T rails; annual capacity, 7,000 net tons. Evan Morris, President; T. K. Hall, Vice-President, and I. M. Butler, Secretary and Treasurer.

Hall Iron Works, Jesse Hall & Son, Hubbard, Trumbull county. Put in operation in November, 1872; 1 double and 6 single puddling furnaces, 2 heating furnaces, and 3 trains of rolls (one 8, one 12, and one 16-inch); product, merchant bar iron; specialty, horse-shoe bar, and bolt and nut iron; annual capacity, 10,000 net tons.

Mahoning Works, Brown, Bonnell & Co., Youngstown, Mahoning county. Built in 1846; 8 double and 38 single puddling furnaces, 11 heating furnaces, 38 nail machines, 1 hammer, 4 spike machines, and 3 trains of rolls (one 8, one 10, and one 18-inch); product, merchant bar, sheets, nails, and railroad and boat spikes; annual capacity, 25,000 net tons; average make, 20,000 tons. *See Mahoning Valley Furnaces.*

Niles Iron Works, Niles Iron Co., Niles, Trumbull county. Put in operation in September, 1872; 1 double and 20 single puddling furnaces, 7 heating furnaces, and 5 trains of rolls; product, bar, sheet, rod, skelp, and band iron; annual capacity, 12,000 net tons; average yearly production, 8,000 tons. L. G. Andrews, President, and L. E. Cochran, Secretary and Treasurer, Youngstown, Mahoning county.

Ridgway Iron Works, Wick, Ridgway & Co., Youngstown, Mahoning county. Built in 1871; 12 double puddling furnaces, 14 heating furnaces, and 6 trains of rolls (one 16, one 19, and four 20-inch); product, railroad and bar iron; annual capacity, 65,000 net tons.

Russia Sheet Iron Mills, L. B. Ward, Niles, Trumbull county. Built in 1864; 12 puddling and 4 heating furnaces, and 3 trains of rolls; product, sheet and plate iron; annual capacity, 7,500 net tons. Formerly part of the works of James Ward & Co.

Ward's Old Mill, James Ward & Co., Niles, Trumbull county. Built in 1841; 19 puddling and 6 heating furnaces, and 5 trains of rolls; product, bar and sheet iron; annual capacity, 14,000 net tons. Unsold part of the works of James Ward & Co. *See Mahoning Valley Furnaces.*

Warren Iron Works, Wm. Richards & Sons, Warren, Trumbull county. Built in 1870; 16 puddling and 2 heating furnaces, and 2 trains of rolls (one 10 and one 18-inch); product, muck and merchant bar; annual capacity, 9,000 net tons. *See Mahoning Valley Furnaces.*

Youngstown Rolling Mill, Youngstown Rolling Mill Co., Youngstown. Built in 1871; 12 single puddling furnaces, 2 heating furnaces, and 2 trains of rolls; product, hoop and band iron, charcoal horse-shoe bar, and compound steel buggy tire; annual capacity, 5,500 net tons; average yearly production, 5,000 tons. Paul Wick, President.

Number of mills in the Mahoning region: 12. Of these, 3 roll rails, 2 making only light T rails.

INTERIOR COUNTIES.

Alliance Rolling Mill, Alliance Rolling Mill Co., Alliance, Stark county. Built in 1867; 2 double puddling furnaces, 11 heating furnaces, and 2 trains of rolls; product, rails; annual capacity, 30,000 net tons; average make, 22,000 tons. Wm. Jones, Secretary.

Cherry Valley Iron Co., Leetonia, Columbiana county. Formerly Leetonia Iron and Coal Co. Built in 1871; 16 single puddling furnaces, 2 heating furnaces, and 3 trains of rolls (one 8, one 16, and one 18-inch); product, muck bar, merchant bar, and guide iron; annual capacity, 10,000 net tons. E. J. Warner, President; J. K. Shinn, Secretary, and J. G. Chamberlain, Superintendent. *See Furnaces.*

Columbus Iron Works, Hayden & Baker, Columbus. Built in 1854; 12 single puddling furnaces, 5 heating furnaces, and 4 trains of rolls; product, merchant bars, splice bars, light T rails, wire of all kinds, and iron for harness and saddle work.

Columbus Rolling Mill, Columbus Rolling Mill Co., Columbus, Franklin county. Built in 1872; 14 single puddling furnaces, 12 heating furnaces, and 3 trains of rolls; product, rails; annual capacity, 30,000 net tons; average make, 25,000 tons. Samuel Thomas, Treasurer and Superintendent.

Dover Rolling Mill, William Davis, Canal Dover, Tuscarawas county. Ten puddling furnaces; product, bar iron and light T rails; annual capacity, 5,000 net tons.

Leetonia Nail and Bolt Co., G. Story, proprietor, Leetonia, Columbiana county. 26 nail machines, and train for making nail plate; no puddling furnaces; annual capacity, 2,600 net tons. H. F. Christy, Agent.

Massillon Rolling Mill, Mitchell & Co., lessees, Massillon, Stark county. Built in 1873, and put in operation Jan. 4, 1875; 6 single puddling furnaces, 2 heating furnaces, and 3 trains of rolls (one 9 and two 18-inch); product, bar iron and light T rails; annual capacity, 6,000 net tons; average annual make, 3,000 tons.

Newark Rolling Mill, Newark Iron Co., Newark, Licking county. Built in 1868; 12 single puddling furnaces, 6 heating furnaces, and 2 trains of rolls (one 9 and one 18-inch); product, rails of heavy sections, rails for coal mines, and bar iron.

Zanesville Iron Works, Ohio Iron Co., Zanesville, Muskingum county. Built in 1848; present Company was incorporated in 1857, and has operated the works since then; 20 single puddling furnaces, 8 heating furnaces, 5 trains of rolls (two 8, one 10, one 16, and one 18-inch), and 1 hammer; product, assorted merchant bar, angle and hoop iron, light T and street rails, hammered car axles, and railroad spikes; annual capacity, 9,000 net tons; average yearly production, 7,000 tons. M.

Churchill, Treasurer and Gen. Manager, and C. W. Greene, Secretary.
See Furnaces.

Number of mills in Central Ohio: 9. Of these, 7 roll rails, 4 making light T rails only.

OHIO RIVER COUNTIES.

Etna Iron and Nail Co., Bridgeport, Belmont county. Put in operation January 1, 1873; 12 single puddling furnaces, 1 scrap furnace, 5 heating furnaces, and 4 trains of rolls (one 9, one 16, one 18, and one 20-inch); product, bar, sheet, plate, and band iron, and light T and street rails; annual capacity, 6,500 net tons. Has never made any nails. W. W. Holloway, President; W. H. Tallman, Secretary, and Lewis Jones, Manager.

Belfont Iron Works, Belfont Iron Works Co., Ironton, Lawrence county. Built in 1852; 19 single puddling furnaces, 3 heating furnaces, 2 trains of rolls, and 80 nail machines; product, nails; annual capacity, 8,750 net tons; average make, 7,500 tons. B. H. Burr, Secretary. *See Furnaces.*

Bellaire Nail Works, Bellaire, Belmont county. Built in 1868; 21 single puddling furnaces, 3 heating furnaces, 2 trains of rolls, and 90 nail machines; product, nails and spikes; annual capacity, 12,000 net tons; average yearly production, 5,000 tons. C. Oglebay, President; A. D. Hilborn, Secretary, and S. E. Montgomery, Manager. *See Furnaces.*

Bloom Forge Iron Works, Gaylord Rolling Mill Co., Portsmouth, Scioto county. Built in 1832; 6 charcoal fires, 1 run-out, 2 double and 14 single puddling furnaces, 10 heating furnaces, 6 trains of rolls, and 2 hammers; product, boiler, bar, sheet, and hoop iron, rivets, blooms, railroad chairs, splice bars, and track bolts, and railroad and boat spikes; annual capacity, 7,500 net tons; average yearly production, 6,500 tons. J. B. Green, Vice-President.

Burgess Steel and Iron Works, Portsmouth. Built in 1871; 12 single puddling furnaces, 9 heating furnaces, 3 trains of rolls (one 8, one 18, and one 20-inch), 2 steam hammers, and 8 steel-melting holes; product, plow steel (German and cast), boiler plate (steel and U. S. Norway), and U. S. Norway and gun-iron shapes, all sizes; annual capacity, 5,000 net tons; average yearly production, 3,000 tons. J. R. Williams, President; G. W. Weyer, Secretary, and M. H. Ball, Treasurer.

Cincinnati Railway Iron Works, Cincinnati Railway Iron Co., Cincinnati, Hamilton county. Built in 1865; product, rails. Not in operation in 1875.

Empire Rolling Mill, Wilder, Boluss & Co., Cincinnati. First put in operation August 1, 1875; 2 heating furnaces, and 2 trains of rolls (one 10 and one 16-inch); product, bar and hoop iron; annual capacity, double turn, 5,000 net tons. Removed here from Seymour, Indiana.

Globe Rolling Mill, Globe Rolling Mill Co., Cincinnati. Built in 1845; 9 single puddling furnaces, 5 heating and 3 scrap furnaces, 1 hammer, and 5 trains of rolls (two 8, one 12, and two 18-inch); product, bars, sheets, plates, angles, all guide irons, wire rods and wire, and scrap steel for plow and other uses; annual capacity, single turn, 6,000 net tons. Joseph Kinsey, President; J. L. Boyer, Vice-President, and E. N. Rogers, Secretary.

Ironton Rolling Mill, Iron and Steel Co., Ironton, Lawrence county. Built in 1852, and enlarged several times since; 21 single puddling furnaces, 8 heating furnaces, and 5 trains of rolls. The steel department is operated on the Burgess principle, which converts the metal into steel in the boiling (or puddling) furnace; hence as many boiling furnaces can be used in the manufacture of steel as trade requires. Product, merchant iron, and agricultural and machine steel; annual capacity, single turn, 9,000 net tons, double turn, 15,000 tons. Robert Scott, President; John Campbell, Vice-President, and Daniel R. Wolfe, Secretary and Treasurer. *See Furnaces.*

Jefferson Iron Works, Spaulding, Woodward & Co., Steubenville, Jefferson county. Built in 1859; 22 single puddling furnaces, 3 heating furnaces, 2 trains of rolls, and 84 nail machines; product, nails; annual capacity, 9,000 net tons; average annual production, 7,000 tons. *See Furnaces.*

Lawrence Iron Works, Lawrence Iron Works Co., Ironton. Built in 1853; 18 single puddling furnaces, 6 heating furnaces, and 5 trains of rolls (two 8, one 9, one 16, and one 18-inch); product, bar, band, chair, spike, and hoop iron of every variety, cotton ties, and light T rails, from 8 to 30 lbs; annual capacity, 8,000 net tons; average yearly production, about 6,000 tons. Cyrus Ellison, President; Wm. L. Keepers, Superintendent, and Geo. T. Scott, Secretary.

Marietta Rail Mill, Marietta Coal and Iron Co., Marietta, Washington county. Built in 1867; 12 single puddling furnaces, 9 heating furnaces, 4 trains of rolls, and 1 squeezer; product, rails, fish plate, and bar, hoop, and bridge iron; annual capacity, 30,000 net tons. A. J. Warner, President; James McArthur, Vice-President, and T. D. Dale, Secretary.

Ohio City Iron and Nail Works, Martin's Ferry, Belmont county. Built in 1873-4; 10 single puddling furnaces, 3 heating furnaces, 2 trains of rolls, and 50 nail machines; first keg of nails made on March 4, 1874; product, nails and skelp iron; annual capacity, 5,000 net tons. J. N. Willard, Business Manager; William Clark, President; James Kerr, Vice-President; C. A. Burrows, Secretary; C. H. Jenkins, Treasurer, and Wm. Barnett, Superintendent.

Pioneer Rolling Mill, David Morgan, Irondale, Jefferson county. 10

double puddling furnaces, and 2 trains of rolls; product, muck bar; annual capacity, 9,000 net tons. Formerly part of the Alliance Rolling Mill Co.'s establishment. *See Furnaces.*

Pomeroy Iron Works, Pomeroy Iron Co., Pomeroy, Meigs county. Built in 1847; 16 single puddling furnaces, 4 heating furnaces, 5 trains of rolls, and 16 nail machines; product, bar, band, and hoop iron, rounds and squares, light T and flat rails, nails, and boat and cut spikes; annual capacity, 10,500 net tons. V. B. Horton, President; J. W. Thomas, Secretary and Treasurer, and Dr. A. L. Norton, Agent.

Vulcan Iron and Tube Works, Evans, Clifton & Co., Cincinnati. Built in 1864; 7 single puddling furnaces, 6 heating furnaces, and 3 trains of rolls (one 8, one 18, and one 19-inch); product, bar, rod, band, and sheet iron; annual capacity, 4,500 net tons; average make, 2,400 tons. Number of mills in the Ohio River counties: 16. Of these, 5 roll rails, 3 making only light T and flat rails. Total number of mills in Ohio: 46. Of these 19 roll rails, 10 making only light T and flat rails.

INDIANA.

Capital City Iron Works, Capital City Iron Co., Indianapolis, Marion county. One scrap furnace, 11 single puddling furnaces, 3 heating furnaces, and 3 trains of rolls (one puddle train, one 8-inch guide, and one 15-inch bar); product, bar iron, hoop iron, splice bars, small T rails, and bridge iron; annual capacity, 5,400 net tons. V. Bulich, President.

Evansville Rolling Mill, Evansville, Vanderburgh county. Built in 1872, and put in operation in June, 1873; 16 single puddling furnaces, 9 heating furnaces, and three 21-inch trains of rolls; product, rails; annual capacity, 25,000 net tons. The old organization, called the Evansville Rolling Mill Co., has dissolved. A new organization under a different name will be formed in a short time, but the name had not been determined upon up to the 15th of December, 1875.

Greencastle Iron and Nail Co., Greencastle, Putnam county. Put in operation in January, 1868; 12 single puddling furnaces, 3 heating furnaces, two 18-inch trains of rolls, and 32 nail machines; product, nails; annual capacity, 2,250 net tons; average make, 2,000 tons.

Indianapolis Rolling Mill, Indianapolis Rolling Mill Co., Indianapolis, Marion county. Built in 1857; 4 double and 2 single puddling furnaces, 4 puddling machines, 8 heating furnaces, and 3 trains of rolls; product, light and heavy rails and splice bars; annual capacity, 30,000 net tons; average yearly production, 16,800 tons. Aquilla Jones, President; C. B. Parkman, Secretary, and W. O. Rockwood, Treasurer. *See Planet Furnace.*

New Albany Rail Mill Co., New Albany, Floyd county. Built in 1864; 5 double and 6 single puddling furnaces, 8 heating furnaces, and 4 trains of rolls; product, fish bars and 12 to 65 lb. rails; annual capacity, 16,000 net tons; average yearly production, 10,000 tons. Rudolph Fink, General Manager.

Ohio Falls Iron Works, Ohio Falls Iron Works Co., New Albany. Built in 1867; 16 single puddling furnaces, 3 heating furnaces, 3 trains of rolls, and 20 nail machines; product, bridge and bar iron, nails and railroad spikes; annual capacity, 8,000 net tons; average yearly production, 5,500 tons.

Terre Haute Iron and Nail Works, Terre Haute, Vigo county, Indiana. Built in 1863; destroyed by fire September 19, 1873, but rebuilt in the winter of 1873-4; new works have 70 nail machines, 15 single puddling furnaces, 1 scrap furnace, 3 heating furnaces, and 2 trains of rolls; product, nails; annual capacity, 180,000 kegs, or 9,000 net tons. F. Nippert, President, and James C. McGregor, Secretary.

Wabash Iron Co., Terre Haute. Completed in January, 1874; 11 single puddling furnaces, 1 scrap furnace, 3 heating furnaces, and 3 trains of rolls (one 8, one 18, and one 20-inch); product, all kinds of bar iron; annual capacity, 5,000 net tons. A. J. Crawford, President, and J. P. Crawford, Secretary and Treasurer.

Western Iron Co., Knightsville, Clay county. Built in 1868; 5 double and 7 single puddling furnaces, and 1 train of rolls; product, muck bar; annual capacity, 10,000 net tons. *See Furnaces.*

Number of mills in Indiana: 9. Of these, 4 roll rails, 1 making only light T rails.

REMOVED.

Seymour, Jackson county. Merchant mill; built in 1873-4, and torn down and removed, a short time after its erection, to Cincinnati, where it is now called the Empire Rolling Mill.

ILLINOIS.

Belleville Nail Mill Co., Belleville, St. Clair county. Built in 1871; 16 puddling furnaces, 3 heating furnaces, 2 trains of rolls, and 48 nail machines; product, all kinds of cut nails; annual capacity, 7,000 net tons; average annual make, 3,750 tons. Wm. C. Buchanan, President; John Thomas, Vice-President; James C. Waugh, Secretary; Frederick H. Pieper, Treasurer; and B. F. Prentis and C. Locke, Managers.

Chicago Plate and Bar Mill Co., 36 Dearborn street, Chicago.

East St. Louis Co-operative Rail Mill Co., East St. Louis, St. Clair county. Office at the works. Built in 1865; 6 double puddling furnaces, 8 heating furnaces, and 3 trains of rolls (one 14, one 18, and one 20-inch);

product, light and heavy T rails; annual capacity, 20,000 net tons. Vital Jarrot, President; M. V. Smith, Vice-President and Manager, and M. Millard, Secretary.

Joliet Iron and Steel Works, Joliet Iron and Steel Co., 93 Dearborn street, Chicago. Works at Joliet, Will county. Built in 1870; made the first steel rail March 15, 1873; puddle mill has 9 double puddling furnaces and 1 double heating furnace, one 16 and one 21-inch train of rolls, and 1 squeezer; iron rail mill has 8 heating furnaces, and 3 trains of 21-inch, 3-high rolls; the Bessemer steel works has two 5-ton converters, 2 double Siemens heating furnaces, one 30-inch blooming train, and 3 trains of 23-inch rolls; product, iron and Bessemer steel rails; annual capacity, 50,000 net tons steel ingots, and 95,000 net tons iron and steel rails. John G. Scott, President; H. E. Bigelow, Secretary; Chas. H. Curtis, Treasurer, and H. S. Smith, General Superintendent. *See Furnaces.*

Joseph H. Brown Iron and Steel Co., Chicago. Building in 1875; product to be bar iron, beams and rails. Joseph H. Brown, of Youngstown, O., President.

North Chicago Rolling Mill, North Chicago Rolling Mill Co., Chicago. Built in 1857; 7 double and 7 single puddling furnaces, 26 single and 3 double heating furnaces, 10 trains of rolls, and 1 hammer; Bessemer steel works has two 5-ton converters and all the appliances for making rails; product, Bessemer steel ingots, and iron and Bessemer steel rails; annual capacity, 50,000 net tons steel rails, and 50,000 tons iron rails. O. W. Potter, President, and R. C. Hannah, Secretary. *See Furnaces.*

Northwestern Nail Works, Lewis & J. C. Holloway, Dunleith, Jo Daviess county. Built in 1875-6, and to be started Feb. 1, 1876; 2 heating furnaces, 2 trains of rolls, and 6 nail machines; product, nails and spikes; annual capacity, 2,000 net tons.

Springfield Iron Works, Springfield Iron Co., Springfield, Sangamon county. Put in operation Sept. 13, 1872; 6 ordinary double puddling furnaces, 2 Siemens double puddling furnaces, 4 Siemens double reheating furnaces, 1 ordinary reheating furnace, 1 hammer, one 23-inch train of rolls with 3 stands, and one 18-inch train with 2 stands and squeezer attached; product, rails; annual capacity, 40,000 net tons. Steel works now building, containing 2 Siemens-Martin furnaces, with an auxiliary furnace and necessary gas producers, to be completed in 1876. Charles Ridgely, President; John W. Bunn, Vice-President, and Geo. M. Brinkerhoff, Secretary.

St. Louis Bolt and Iron Co., St. Louis, Mo. Works in St. Clair county, Illinois. Put in operation in January, 1873; 2 single and 2 double puddling furnaces, 3 heating furnaces, 2 trains of rolls, 3 spike machines,

1 bolt header, 3 bolt cutters, and 2 nut tappers; product, bar iron, small T and street rails, fish plates, bolts, washers and spikes; annual capacity, 6,000 net tons.

Union Rolling Mill, Union Rolling Mill Co., Chicago. Built in 1863; 12 heating furnaces, 1 train of flat rolls, 1 rail train, and 1 hammer and a blooming train for steel ingots; the Bessemer steel works has two 5-ton converters, 4 cupolas and 2 spiegel-melting furnaces; product, iron and Bessemer steel rails; total annual capacity, 50,000 net tons. A. B. Stone, President, 64 Wall street, New York; W. H. Chisholm, Vice-President and Manager, and J. B. Stubbs, Secretary. *See Furnaces.* Number of mills in Illinois: 9 completed establishments, and 1 building. Of these, 6 roll rails, 1 making light rails only.

REMOVED.

The Decatur Rolling Mill has been removed from Decatur, Ill., to Rose-dale, Wyandotte county, Kansas. Office at Kansas City, Mo.

MICHIGAN.

Jackson Iron Manufacturing Co., Jackson, Jackson county. Built in 1872; put in operation in March, 1873; 4 double puddling furnaces, 2 heating furnaces, 2 trains of rolls, and 1 hammer; product, bar iron; annual capacity, 3,000 net tons.

Marquette Rolling Mill, Marquette and Pacific Rolling Mill Co., Marquette, Marquette county. Built in 1871; 2 double and 6 single puddling furnaces, 1 heating furnace, and 2 trains of rolls; product, bar iron; annual capacity, 4,500 net tons. E. A. Elliott, President, Detroit; Jno. Scudder, Secretary, and W. W. Wheaton, Agent. *See Furnaces.*

Wyandotte Rolling Mills, Wyandotte Rolling Mill Co., Detroit. Works at Wyandotte, Wayne county. Built in 1855; 4 double and 5 single puddling furnaces, 14 heating furnaces, 7 trains of rolls, and 2 hammers; product, rails, bars, plates and sheets; annual capacity, 18,000 net tons rails, 3,000 tons bars, 3,000 tons plates, and 500 tons sheets; average annual production, 8,000 tons rails, 1,500 tons bars, 1,500 tons plates, and 500 tons sheets. T. C. Owen, President; H. C. Hodges, Vice-President, and V. K. Moore, Secretary and Manager. *See Furnaces.*

Number of mills in Michigan: 3. Of these, 1 rolls rails.

WISCONSIN.

Milwaukee Iron Works, Milwaukee Iron Co., Milwaukee, Milwaukee county. Built in 1868 and 1874; 16 double and 2 single puddling furnaces, 25 heating furnaces (in part Siemens furnaces), 7 trains of rolls, and 1 hammer; product, rails, merchant bar iron, fish plates, car links

and pins, and horse shoes ; annual capacity, 44,800 net tons of rails, 15,000 tons merchant bar iron, and 10,000 tons fish plates, etc. J. J. Hagerman, President, and Alexander Mitchell, Treasurer.

Number of mills in Wisconsin ; 1 rail mill.

MISSOURI.

Harrison Wire Works, Harrison Wire Co., St. Louis. Built and started in 1873 ; 1 single and 1 double puddling furnace, 4 heating furnaces, 2 blooming fires, 1 hammer, 162 wire blocks, and one 18-inch and one 8-inch train of rolls ; product, iron wire and small round iron from $\frac{1}{16}$ to $\frac{3}{4}$ inch ; annual capacity, 5,000 net tons. Wm. B. Dean, Treasurer.

Helmbacher Forge and Rolling Mills, St. Louis. Built in 1858 ; 7 single puddling furnaces, 9 heating furnaces, 2 trains of rolls, and 5 hammers ; product, bar, rod, band, and angle iron, car axles, light T rails from 12 to 25 lbs., and all kinds of forgings for railroad and steamboat use ; annual capacity, 10,000 net tons ; average annual production, 6,500 tons. M. Helmbacher, President ; A. Helmbacher, Treasurer and Superintendent, and G. L. Goetz, Secretary.

La Clede Rolling Mill, Chouteau, Harrison & Valle, St. Louis. Built in 1850 ; 1 double and 18 single puddling furnaces, 7 heating furnaces, and 4 trains of rolls ; product, flat rails, bar, sheet, and plate iron, and rail fastenings ; annual capacity, 10,000 net tons ; average yearly production, 8,000 tons. Edwin Harrison, President ; Charles A. Maffitt, Vice-President, and Eugene A. Fusz, Secretary.

St. Louis Steam Forge and Iron Works, A. McDonald & Co., St. Louis. Product, bar iron and forgings.

Tudor Iron Works, St. Louis Rail Fastening Co., P.O. Box 2863, St. Louis. Built in 1870 ; 3 heating furnaces, 2 trains of rolls, and 3 spike machines ; product, spikes, bolts, fish plates, and merchant iron ; annual capacity, 6,000 net tons ; average yearly production, 3,500 tons. Hudson E. Bridge, President ; Geo. E. Leighton, Vice-President and Treasurer, and C. Minnigerode, Jr., Secretary.

Vulcan Iron Works, 221 Olive street, St. Louis. Built in 1872 ; 18 double and 2 single puddling furnaces, 17 heating furnaces, and three 22-inch trains of rolls ; product, light and heavy rails ; annual capacity, 50,000 net tons. Bessemer steel works building ; two 6-ton converters ; 3 pig-iron cupolas, 40 x 8 ; 4 spiegel-melting furnaces, 40 x 5 ; two 12-ton cupola ladles ; 12 gas producers and 3 heating furnaces ; one 3-ton hammer ; rail mill attached ; to be completed by March, 1876. D. R. Garrison, President ; D. K. Ferguson, Vice-President ; O. L. Garrison, Secretary and Treasurer ; D. E. Garrison, Manager. *See Furnaces.*

Number of mills in Missouri: 6. Of these, 3 roll rails, 2 making light rails only.

PROJECTED.

La Grange Rolling Mill, La Grange, Lewis county. Rail mill. Partly built in 1872; not finished.

KANSAS.

Kansas Rolling Mill Company, Kansas City, Missouri. Two mills: One, at Rosedale, Wyandotte county, Kansas, 3 miles from Kansas City, is composed of the plant that was formerly at Decatur, Illinois, having been removed and rebuilt in 1875; it was first erected in 1870, has 9 heating furnaces and 3 trains of rolls (two 15 and one 20-inch), a yearly capacity of 25,000 net tons, and makes rails only. The other, at Topeka, Shawnee county, Kansas, 67 miles from Kansas City, is leased from the Topeka Rolling Mill Co., first put in operation May 26, 1874, contains 6 heating furnaces and one train of 19-inch rolls, has a yearly capacity of 20,000 net tons, and makes rails only. A. B. Stone, President, 64 Wall street, New York; W. H. Harris, Vice-President and General Manager, Kansas City; Ira Harris, Jr., Secretary, Kansas City; and S. C. Baldwin, General Agent, Cleveland, O.

Number of mills in Kansas: 2 rail mills.

WYOMING TERRITORY.

Laramie Rolling Mills, Laramie City, Albany county. Built in 1874-5; put in operation in April, 1875; product, rails; daily make, 45 gross tons. Joseph Richardson, Manager, and Harry Brazar, Superintendent of works.

Number of mills in Wyoming Territory: 1 rail mill.

UTAH TERRITORY.

Ogden Iron Manufacturing Co., Ogden City. Building a merchant mill in 1875, to contain 2 trains of rolls (one 9, and one 18-inch), and to be operated by water-power. Wm. Howard, Secretary. *See Furnaces.*

Number of mills in Utah: 1 building.

CALIFORNIA.

Pacific Rolling Mill and Forge, Pacific Rolling Mill Co., San Francisco. Put in operation July 25, 1868; 1 double and 3 single puddling furnaces, 13 heating furnaces, 5 trains of rolls, 2 spike and 2 rivet machines, and 5 hammers; product, bar iron, angle iron, shafting, 12 to 60 lb. rails, railroad, ship and boat spikes, bridge work, bolts, all kinds (except carriage), nuts, washers, boiler rivets, horse-shoe shapes,

car axles, and all kinds of railroad and ship forgings; annual capacity, 25,000 net tons. Wm. Alvord, President; L. B. Benchley, Vice-President and Manager; S. J. C. Swezey, Secretary and Treasurer, and B. P. Brunner, Superintendent.

Number of mills in California: 1 rail mill.

Number of mills in the United States: 331 completed establishments, and 3 building. Of these, 97 roll rails, 37 making only light T and street rails.

RAIL MILLS.

LIST OF ROLLING MILLS WHICH MAKE LIGHT AND HEAVY SECTIONS OF RAILROAD BARS AND STREET RAILS.

[For complete description of the works enumerated below see the preceding list of rolling mills.]

MAINE.

Portland Rolling Mill, Portland Rolling Mill Co., Portland.

Total in Maine: 1 rail mill.

VERMONT.

St. Albans Iron and Steel Works, St. Albans Iron and Steel Co., St. Albans, Franklin county.

Total in Vermont: 1 rail mill.

MASSACHUSETTS.

Bay State Iron Works, Bay State Iron Co., Boston.

Washburn Iron Works, Washburn Iron Co., Worcester.

Total in Massachusetts: 2 rail mills.

NEW YORK.

Albany and Rensselaer Iron and Steel Co., Troy, Rensselaer county. Iron and Bessemer steel.

Buffalo Iron and Nail Works, Pratt & Co., Buffalo, Erie county. Street rails.

Delano Iron Works, Delano Iron Co., Syracuse, Onondaga county.

Elmira Iron and Steel Rolling Mills, Elmira Iron and Steel Rolling Mill Co., Elmira, Chemung county.

Rome Iron Works, Rome Iron Co., Rome, Oneida county.

Spuyten Duyvil Rolling Mill, Spuyten Duyvil Rolling Mill Co., Spuyten Duyvil, Westchester county.

Union Iron Works, Union Iron Co., Buffalo.

Total in New York: 7 rail mills, of which 1 rolls street rails only.

NEW JERSEY.

New Jersey Steel and Iron Co., Cooper, Hewitt & Co., 17 Burling Slip, New York. Works at Trenton, Mercer county.

Total in New Jersey: 1 rail mill.

PENNSYLVANIA—EASTERN DISTRICT.

Allentown Rolling Mill Co., Allentown, Lehigh county. Office, 303 Walnut street, Philadelphia. Rails of light and heavy sections and street rails.

Bethlehem Iron Co., Bethlehem, Northampton county. Iron and Bessemer steel.

Catasauqua Manufacturing Co., Catasauqua, Lehigh county. Light rails.

Glen Iron Works, Allentown, Lehigh county. Light rails.

Little Schuylkill Rolling Mill, James A. Inness, Port Clinton, Schuylkill county. Light rails.

Palo Alto Rolling Mill, Benjamin Haywood, Pottsville, Schuylkill county. Rails of light and heavy sections and street rails.

Philadelphia and Reading Rolling Mill, Philadelphia and Reading Railroad Co., owners, W. E. C. Coxe, Superintendent, Reading, Berks county.

Philadelphia Iron and Steel Co., 939 North Delaware avenue, Philadelphia. Street rails.

Pottsville Rolling Mills, Atkins Brothers, Pottsville. Rails of light and heavy sections and street rails.

Schuylkill Haven Rolling Mill and Spike Manufacturing Co., Weissinger & Medlar, Schuylkill Haven, Schuylkill county. Light rails.

Tamaqua Rolling Mill, Wm. T. Carter & Co., Tamaqua, Schuylkill county. Office, 103 Walnut street, Philadelphia. Light rails.

Total in Eastern Pennsylvania: 11 rail mills, of which 6 roll only light and street rails.

PENNSYLVANIA—CENTRAL DISTRICT.

Columbia Steel and Iron Works, Maitland, Audenreid & Co., Columbia, Lancaster county. Office, N. E. corner Third and Dock streets, Philadelphia.

Co-operative Iron and Steel Works, Danville, Montour county.

Danville Iron Works, William Faux, Danville.

- Hancock Steel and Iron Co., Danville.
- Hollidaysburg Iron Works, Hollidaysburg Iron and Nail Co., Hollidaysburg, Blair county. Light rails.
- Lackawanna Iron Works, Lackawanna Iron and Coal Co., Scranton, Luzerne county. Iron and Bessemer steel.
- Lochiel Rolling Mill Co., Harrisburg.
- Pennsylvania Iron Works, Waterman & Beaver, Danville. Office, 407 Library street, Philadelphia.
- Pennsylvania Steel Works, Pennsylvania Steel Co., Steel Works P. O., Baldwin Station, Dauphin county. Office, 216 South Fourth street, Philadelphia. Rails of heavy sections and street rails. Bessemer steel only.
- Safe Harbor Rolling Mill, Safe Harbor, Lancaster county. Not in operation for several years.
- Total in Central Pennsylvania: 10 rail mills, of which 1 rolls only light rails.

PENNSYLVANIA—WESTERN DISTRICT.

- American Iron Works, Jones & Laughlins, Pittsburgh, Allegheny county. Light rails.
- Brady's Bend Iron Co., Brady's Bend, Armstrong county. Office, 54 Cliff street, New York. Not in operation for several years.
- Cambria Iron Works, Cambria Iron Co., Johnstown, Cambria county. Office, 218 South Fourth street, Philadelphia. Iron and Bessemer steel rails.
- Fort Pitt Iron and Steel Works, Reese, Graff & Woods, Pittsburgh. Light rails.
- Edgar Thomson Steel Works, Edgar Thomson Steel Co., Limited, Bessemer Station, Allegheny county. Branch office at Pittsburgh. Bessemer steel only.
- Kensington Rolling Mill, H. Lloyd, Son & Co., Pittsburgh. Light rails.
- Old Fort Iron Works, Jacobs & Jackson, Brownsville, Fayette county. Light rails.
- Sharon Rolling Mills, Westerman Iron Co., Sharon, Mercer county. Light rails.
- Shenango Iron Works, Reis, Brown & Berger, New Castle, Lawrence county. Light rails.
- Sligo Iron Works, Phillips, Nimick & Co., Pittsburgh. Light rails.
- Superior Rolling Mill, Harbaugh, Mathias & Owens, Pittsburgh. Not in operation for several years.
- Wayne Iron and Steel Works, Brown & Co., Pittsburgh. Light rails.
- Wheatland Rolling Mills, Wheatland, Mercer county. Not in operation for several years.

Total in Western Pennsylvania: 13 rail mills, of which 8 roll only light rails. Total in Pennsylvania: 34 rail mills, of which 15 roll only light and street rails.

MARYLAND.

Abbott Iron Works, Abbott Iron Co., Baltimore.

Cumberland Rolling Mill, Baltimore and Ohio Railroad Co., Cumberland.

Total in Maryland: 2 rail mills.

GEORGIA.

Rome Iron Works, Rome Iron Manufacturing Co., Rome. Light rails.

Scofield Rolling Mill, Scofield Rolling Mill Co., Atlanta.

Total in Georgia: 2 rail mills, of which 1 rolls only light rails.

WEST VIRGINIA.

Crescent Iron Works, Crescent Iron Co., Wheeling.

Riverside Iron Works, Wheeling. Light rails.

Total in West Virginia: 2 rail mills, of which 1 rolls only light rails.

KENTUCKY.

Covington Rolling Mill, James G. Kyle & Bro., Covington. Office, Cincinnati.

Kentucky and Louisville Rolling Mills, Louisville Rolling Mill Co., Louisville. Light rails and street rails.

Swift's Iron and Steel Works, Newport. Office, Cincinnati. Light rails and street rails.

Total in Kentucky: 4 rail mills, of which 3 roll only light and street rails.

TENNESSEE.

Memphis Rolling Mill, R. C. Daniel, Memphis. Street rails.

Roane Iron Works, Roane Iron Co., Chattanooga.

Vulcan Works, Chattanooga. Light rails.

Total in Tennessee: 3 rail mills, of which 2 roll only light rails.

OHIO.

Ætna Iron and Nail Co., Bridgeport, Belmont county. Light T rails and flat rails.

Akron Iron Works, Akron Iron Co., Akron, Summit county. Light rails.

Alliance Rolling Mill, Alliance Rolling Mill Co., Alliance, Stark county.

Cincinnati Railway Iron Works, Cincinnati Railway Iron Co., Cincinnati.

Cleveland Iron Works, Cleveland Iron Co., Cleveland.

Cleveland Rolling Mill Co., Cleveland. Lake Shore and Newburgh Mills.
Iron and Bessemer steel.

Columbus Iron Works, Hayden & Baker, Columbus. Light rails.

Columbus Rolling Mill, Columbus Rolling Mill Co., Columbus.

Dover Rolling Mill, William Davis, Canal Dover, Tuscarawas county.
Light rails.

Girard Rolling Mill, Girard Rolling Mill Co., Girard, Trumbull county.
Light rails.

Lawrence Iron Works, Lawrence Iron Works Co., Ironton. Light rails.

Marietta Rail Mill, Marietta Coal and Iron Co., Marietta, Washington county.

Massillon Rolling Mill, Mitchell & Co., Massillon. Light rails.

Nes Silicon Steel Works, Nes Silicon Steel Co., Sandusky, Erie county.

Newark Rolling Mill, Newark Iron Co., Newark, Licking county.

Pomeroy Iron Works, Pomeroy Iron Co., Pomeroy, Meigs county. Light
T rails and flat rails.

Ridgway Iron Works, Wick, Ridgway & Co., Youngstown.

Union Iron Works Co., Cleveland. Light rails.

Zanesville Iron Works, Ohio Iron Co., Zanesville. Light rails.

Total in Ohio: 19 rail mills, of which 10 roll only light and street rails.

INDIANA.

Capital City Iron Works, Capital City Iron Co., Indianapolis. Light rails.

Evansville Rolling Mill, Evansville Rolling Mill Co., Evansville.

Indianapolis Rolling Mill, Indianapolis Rolling Mill Co., Indianapolis.

New Albany Rail Mill Co., New Albany.

Total in Indiana: 4 rail mills, of which 1 rolls only light rails.

ILLINOIS.

East St. Louis Co-operative Rail Mill Co., East St. Louis, St. Clair county.

Joliet Iron and Steel Works, Joliet Iron and Steel Co., Joliet, Will county. Office at Chicago. Iron and Bessemer steel rails.

North Chicago Rolling Mill, North Chicago Rolling Mill Co., Chicago.
Iron and Bessemer steel rails.

Springfield Iron Works, Springfield Iron Co., Springfield, Sangamon county.

St. Louis Bolt and Iron Co., St. Louis, Mo. Works in St. Clair county, Illinois. Light T rails and street rails.

Union Rolling Mill, Union Rolling Mill Co., Chicago. Iron and Bessemer steel rails.

Total in Illinois: 6 rail mills, of which 1 rolls only light and street rails.

MICHIGAN.

Wyandotte Rolling Mills, Wyandotte Rolling Mill Co., Wyandotte, Wayne county. Office at Detroit.

Total in Michigan: 1 rail mill.

WISCONSIN.

Milwaukee Iron Works, Milwaukee Iron Co., Milwaukee.

Total in Wisconsin: 1 rail mill.

MISSOURI.

Helmbacher Forge and Rolling Mills, St. Louis. Light rails.

La Clede Rolling Mill, Chouteau, Harrison & Valle, St. Louis. Flat rails.

Vulcan Iron Works, St. Louis. Office, 221 Olive street. Has heretofore made only iron rails; but a Bessemer steel plant is now being built, which will be completed in 1876.

Total in Missouri: 3 rail mills, 2 of which roll only light and flat rails.

PROJECTED.

La Grange Rolling Mill, La Grange Rolling Mill Co., La Grange, Lewis county. Begun to build in 1872; not yet completed.

KANSAS.

Kansas Rolling Mill Co., Topeka and Rosedale. Office, Kansas City, Missouri.

Total in Kansas: 2 rail mills.

CALIFORNIA.

Pacific Rolling Mill and Forge, Pacific Rolling Mill Co., San Francisco. Rails of all sizes.

Total in California: 1 rail mill.

WYOMING TERRITORY.

Laramie Rolling Mills, Laramie City.

Total in Wyoming Territory: 1 rail mill.

Total in the United States: 97 rail mills, of which 37 roll only light and street rails.

BESSEMER STEEL RAIL MILLS.

A COMPLETE LIST OF ROLLING MILLS IN THE UNITED STATES WHICH MANUFACTURE BESSEMER STEEL RAILS.

Albany and Rensselaer Iron and Steel Co., Troy, New York. Two five-ton converters, and one one-and-a-half-ton converter.

Cambria Iron Works, Cambria Iron Co., Johnstown, Pa. Office, 218 South Fourth st., Philadelphia. Two five-ton converters.

Pennsylvania Steel Works, Pennsylvania Steel Co., Baldwin Station, near Harrisburg, Pa. Office, 216 South Fourth st., Philadelphia. Two five-ton converters.

Newburgh Rolling Mill, Cleveland Rolling Mill Co., Cleveland, Ohio. Four five-ton converters.

North Chicago Rolling Mill, North Chicago Rolling Mill Co., Chicago, Illinois. Two five-ton converters.

Union Rolling Mill, Union Rolling Mill Co., Chicago, Illinois. Two five-ton converters.

Joliet Iron and Steel Works, Joliet Iron and Steel Co., Joliet, Illinois. Two five-ton converters. These works made their first blow January 26, 1873, and their first steel rail March 15, 1873.

Bethlehem Rolling Mill, Bethlehem Iron Co., Bethlehem, Pa. Two five-ton converters. These works made their first blow on Saturday, October 4, 1873, and their first steel rail on Saturday, October 18, 1873.

Edgar Thomson Steel Works, Edgar Thomson Steel Co., Limited, Bessemer Station, Allegheny county, Pa. Branch office at Pittsburgh. Two five-ton converters. These works made their first blow August 26, 1875, and their first steel rail September 1, 1875.

Lackawanna Iron Works, Lackawanna Iron and Coal Co., Scranton, Pa. Two five-ton converters. The foundations were laid June 16, 1874, the first blow was made October 23, 1875, and the first steel rail rolled December 29, 1875.

Vulcan Iron Works, St. Louis, Mo. Steel works, to contain two five-ton converters, were begun in 1875.

Number of Bessemer steel works: 10 completed, and 1 building.

RECENTLY ABANDONED ROLLING MILLS.

MASSACHUSETTS.

Dighton Rolling Mill, Dighton Rolling Mill Co., Dighton, Bristol county.

Built in 1866; destroyed by fire in 1869, and not rebuilt.

New England Iron Co., Readville, Norfolk county. Built in 1862; 6 double and 2 single puddling furnaces, 4 heating furnaces, and 3 trains of rolls; product, bar iron, gas plates and shapes; annual capacity, 8,000 net tons; average annual production, 6,000 tons. These works have been purchased by Wm. E. Coffin & Co., of Boston, who have sold the machinery and torn down the building.

CONNECTICUT.

Hunt Canfield Iron Co., Huntsville, Litchfield county. Destroyed by fire, and not rebuilt.

NEW JERSEY.

North River Rolling Mill, Alex. C. Durbin, Thirteenth and Henderson streets, Jersey City. Product, fire-box and boiler plate; annual capacity, 3,000 net tons; average yearly production, 1,500 tons. Torn down in 1875.

PENNSYLVANIA.

Colemanville Rolling Mill, Colemanville, Lancaster county. Old merchant mill; has not been in operation for several years, and was burned in 1875. Will not be rebuilt.

Juniata Iron Works, S. & B. R. Hatfield, Alexandria, Huntingdon county. Built in 1838; product, sheet, plate, and bar iron; burned in 1868 and not rebuilt. The firm has a forge at the same place in operation.

MARYLAND.

Mount Savage Iron Co., Mount Savage, Alleghany county. Built in 1839; product, rails. Abandoned several years ago, and completely torn down in 1875.

NORTH CAROLINA.

Briggs's Rolling Mill, Gaston county. Built in 1853; has been standing for five years.

SOUTH CAROLINA.

Magnetic Iron Co., Limestone Springs P. O., Spartanburg county. Works

on Proud River, Union county. F. G. Latham, Agent. Organized about 1840; rolling mill, nail works, forge, foundry, and 4 blast furnaces, each 36 feet high with 9-foot boshes; water-power; worked continuously from organization until 1871; since then the foundry only has been in operation. The Company owns 11,000 acres of land, embracing magnetic and hematite ore fields, but needs capital to put the works into full operation. Formerly the Swedish Iron Mfg. Co.

South Carolina Manufacturing Co., Spartanburg, Spartanburg county. Built in 1835; 1 single puddling furnace, 2 heating furnaces, 3 trains of rolls, 3 nail machines, and 1 hammer; water-power; product, bar iron; blooms, and nails; annual capacity, 2,000 net tons. This mill and two blast furnaces belonging to the same establishment have not been in operation for several years, owing to the lack of skilled labor.

ALABAMA.

Brierfield Iron Works Co., Brierfield, Bibb county. Bar mill. Standing since 1865.

STEEL WORKS.

[Except Bessemer.]

NEW HAMPSHIRE.

Nashua Iron and Steel Co., Nashua, Hillsboro county. Product, open-hearth steel. *See Rolling Mills.*

Number of steel works in New Hampshire: 1.

MASSACHUSETTS.

Bay State Iron Works, Bay State Iron Co., Boston. Product, open-hearth steel. *See Rolling Mills.*

Bridgewater Iron Co., Bridgewater, Plymouth county. Product, steel from steel scrap. *See Rolling Mills.*

Norway Iron Works, Naylor & Co., South Boston. Product, open-hearth steel. *See Rolling Mills.*

Washburn Carwheel Co., Worcester. Office, Hartford, Conn. One 7-ton Siemens open-hearth furnace, ten 4-pot furnaces, one train of tire rolls, and one 30-ton hammer; product, carwheel tires. Nathan Washburn, President.

Number of steel works in Massachusetts: 4.

RHODE ISLAND.

Rumford Chemical Works, Geo. F. Wilson & Co., Providence. One 7-ton Siemens open-hearth furnace; product, open-hearth steel.

Number of steel works in Rhode Island: 1.

CONNECTICUT.

Bridgeport Steel Works, Farist & Windsor, Bridgeport, Fairfield county.

Built in 1868; 2 single puddling furnaces, 3 heating furnaces, 2 trains of rolls (one 12 and one 15-inch), 4 hammers, and 15 steel-melting holes; product, cast steel, rolled and hammered; annual capacity, 1,200 net tons; average make, 750 tons.

Farist Steel Co., Farist & Windsor, Windsor Locks, Hartford county.

Built in 1860; 2 heating furnaces, 2 trains of rolls, 3 hammers, and 10 steel-melting holes; steam and water-power; product, cast steel, rolled and hammered; annual capacity, 750 net tons; average make, 400 tons.

Iron and Steel Works, Derby, New Haven county. Product, steel from steel scrap. *See Rolling Mills.*

Number of steel works in Connecticut: 3.

NEW YORK.

Atlantic Steel Works, Richardson, Boynton & Co., 232 Water street, New York. Abandoned the manufacture of steel in 1875, and now offer their machinery for sale.

Chrome Steel Works, corner Kent avenue and Keap street, Brooklyn.

Built in 1869; 7 heating furnaces, 7 hammers, 24 steel-melting holes, and 2 trains of rolls (one 9 and one 18-inch); product, tool steel; annual capacity, 2,000 net tons. C. P. Haughian, Superintendent.

Monhagen Steel Works, Wheeler, Madden & Clemson Manufacturing Co., Middletown, Orange county. Built in 1863; 3 heating furnaces and one train of rolls; product, sheet steel; annual capacity, 300 net tons; average make, 250 tons.

Onondaga Steel Works, Sweet's Manufacturing Co., Syracuse. Built in 1864; 11 heating furnaces, 3 hammers, and 4 trains of rolls (one 9, one 10, and two 12-inch), 4 steel-cementing furnaces, and 1 steel-melting hole, and 1 gas-pot melting furnace; manipulators of Bessemer steel, and converters of iron into blister steel; products, bar steel, steel crow-bars, seat springs, tire and spring steel, and steel for various other purposes; annual capacity, 4,800 net tons; average annual product, 3,000 tons. Wm. A. Sweet, President and Manager; Fred B. Chapman, Secretary, and J. M. Schermerhorn, Jr., Treasurer.

Number of steel works in New York: 3.

NEW JERSEY.

Adirondac Steel Works, Gregory & Co., Jersey City. Built in 1848; 5 heating furnaces, 5 hammers, 40 steel-melting holes, and 4 trains of rolls (one 9, one 12, one 16, and one 18-inch); product, cast steel; annual capacity, 2,400 net tons; average make, 1,750 tons.

Jersey City Steel Works, James R. Thompson & Co., Jersey City. Commenced operations August 1, 1862; one single and 2 double puddling furnaces, 7 heating furnaces, and 4 trains of rolls (two 9, one 12, and one 16-inch), 5 steam hammers, and two helve hammers, and 56 steel-melting holes; product, cast steel solely; annual capacity, 4,000 net tons.

Lafayette Steel Works, D. G. Gautier & Co., Jersey City. Built in 1870; 17 heating furnaces, 2 hammers, 2 steel-cementing furnaces, 26 4-pot steel-melting furnaces, and 5 trains of rolls (two 9, one 12, one 16, and one 20-inch); product, cast steel; 5 tons of cast steel and 5 tons of spring and Bessemer steel are manipulated daily; annual capacity, 3,000 net tons.

Lewis Iron and Steel Co., Rockaway, Morris county. A. C. Lewis, Manager, 12 Cliff street, New York. Product, cast steel. *See Rolling Mills.*

Newark Steel Works, Benjamin Atha & Co., Newark, Essex county. Commenced business in 1864; 5 steam hammers, and 3 trains of rolls (one 16-inch, one 12-inch, and one 8-inch); product, cast steel; total annual capacity, 2,400 net tons; average annual make, 2,000 tons.

New Jersey Steel and Iron Co., Cooper, Hewitt & Co., Trenton, Mercer county. Office, 17 Burling Slip, New York. Product, open-hearth (Martin) and puddled steel. *See Rolling Mills.*

Pompton Steel Works, James Horner & Co., Pompton, Passaic county. Built in 1863; 4 single puddling furnaces, 6 heating furnaces, 3 trains of rolls, and 5 hammers; water-power; product, bar and cast steel; annual capacity, 2,000 net tons; average make, 2,000 tons.

Trenton Iron Co., Cooper, Hewitt & Co., Trenton. Office, 17 Burling Slip, New York. Product, cast steel. *See Rolling Mills.*

Number of steel works in New Jersey: 8.

PENNSYLVANIA.

Beaver Falls Steel Works, Abel Pedder & Co., Beaver Falls, Beaver county. Built in 1875; 2 Siemens open-hearth furnaces, 1 heating furnace, and 2 trains of rolls (one 16 and one 19-inch); water-power; product, spring, bar, plane, and file steel.

Black Diamond Steel Works, Park, Brother & Co., Pittsburgh. Established in May, 1862; 6 single puddling furnaces, 48 heating and anneal-

ing furnaces, 6 trains of rolls (one 8, one 10, one 12, one 16, one 18, and one 28-inch), 21 hammers, 6 steel-cementing furnaces, 72 steel-melting holes, and two 24-pot gas furnaces; product, all varieties of steel; annual capacity, 10,000 net tons; average make, 4,500 tons.

Blair Iron and Steel Co., Pittsburgh. Works at Glenwood, on the Monongahela River and Connellsville railroad, 5 miles from Pittsburgh. Iron sponge is made from ore by Thomas S. Blair's direct process, and steel ingots are made with sponge in one 5-ton Siemens open-hearth furnace. Product of works is in steel ingots; capacity, 60 net tons per week. There are 5 Blair sponge furnaces, 1 Siemens furnace, 2 heating furnaces, hydraulic machinery, etc.

Chester Steel Castings Co., Chester, Delaware county. Built in 1871; one cupola, and 5 annealing furnaces; product, steel castings; annual capacity, 300 net tons. Frederick Baldt, Manager.

Codorus Steel Works, York County Iron and Steel Co., York, York county. Product, puddled steel. *See Rolling Mills.*

Crescent Steel Works, Miller, Metcalf & Parkin, Pittsburgh. Built in 1867; 8 heating furnaces, 2 trains of rolls (one 12 and one 9-inch), 3 steel-cementing furnaces, 24 steel-melting holes, and four 24-pot Siemens melting furnaces, and 6 hammers; product, hammered and rolled bar steel, and cast, spring, and edge-tool steel; annual capacity, 4,000 net tons; average make, 3,000 tons.

Crucible Cast Steel Casting Co., Limited, Pittsburgh. Built in 1875; 3 steel-cementing furnaces, and 8 steel-melting holes; product, cast steel castings; annual capacity, 600 net tons. J. F. Denniston, Secretary and Treasurer.

Fairmount Steel Works, Alexander Foster & Co., Twenty-fourth street and Pennsylvania avenue, Philadelphia. Built in 1866; 3 heating furnaces, six 4-pot melting furnaces, and 3 steam hammers; product, machinery steel, frog plates and points, cast spring steel, and all kinds of steel forgings; annual capacity, 750 net tons; average make, 500 tons.

Fort Pitt Iron and Steel Works, Reese, Graff & Woods, Pittsburgh. Product, cast steel. *See Rolling Mills.*

Hussey, Binns & Co., Pittsburgh. Steel plant built in 1875; one 24-pot Siemens furnace; product, cast steel, used by the firm in making shovels.

Hussey, Wells & Co., Pittsburgh. Built in 1859; 16 single puddling furnaces, 20 heating furnaces, 10 steam hammers, 3 tilt hammers, 75 2-pot coke steel furnaces, 6 24-pot Siemens furnaces, and 8 trains of rolls (one 9, one 12, three 16, two 18, and one 28-inch); product, crucible cast steel, in bars, sheets, rods, plates, and forgings of all kinds; annual capacity, 13,000 net tons ingots; average make for 5 years, 5,000 net tons.

- Kensington Iron and Steel Works, James Rowland & Co., 920 North Delaware avenue, Philadelphia. Product, steel from steel scrap. *See Rolling Mills.*
- Keystone Saw, Tool, Steel and File Works, Henry Disston & Sons, Front and Laurel streets, Philadelphia. Branch Works at Tacony, Philadelphia. Founded in 1840, and commenced the manufacture of steel in 1854; now running 42 melting furnaces, 2 trains of rolls, 6 heating furnaces, and 1 hammer; product, principally saw steel of every description, also tool steel, homogeneous steel, steel for engravers' plates, etc.; annual capacity, 2,500 net tons.
- La Belle Steel Works, Smith, Sutton & Co., Pittsburgh. Built in 1863; four 25-ton converting furnaces, 4 open-hearth refining furnaces, 4 puddling furnaces, 7 heating furnaces, 12 cast-steel melting furnaces, 5 hammers, and 3 trains of rolls, (one 20, one 16, and one 10-inch); product, cast and German plow steel, agricultural steel of every description, cast and German spring steel, cast machinery steel, cast tool steel, and cast and German steel tire; also, finished springs and iron and steel axles; annual capacity, 6,000 net tons.
- Midvale Steel Works, Nicetown P. O., Philadelphia. Built in 1866; one 4-ton air furnace for melting pig, and 11 coal and 3 gas-heating furnaces; one gas pot muffle and one kiln for drying; moulding and annealing shop, with 2 annealing and 4 drying furnaces; 5 steam hammers, from 8 tons to 300 lbs.; tire-rolling mill, with capacity for 30 tires a day; machine shop, with five 80-inch boring and turning mills, two 80-inch and four 24-inch lathes, and one planer, 36 inches by 10 feet; one 30-ton converting furnace, with a yearly capacity of 500 net tons, fifty 4-pot steel-melting holes, one 30-pot Siemens gas melting furnace, one 6-ton Siemens open-hearth furnace, and one 4-ton Sellers open-hearth melting furnace; product, axles, tires, and tool, machinery, spring and frog steel, and all kinds of castings and forgings; daily capacity, 40 net tons, and yearly capacity, 12,000 net tons, of cast steel. William Sellers, President; Marriott C. Smyth, Secretary, and C. A. Brinley, Superintendent.
- Oxford Iron and Steel Works, William & Harvey Rowland, Frankford, Philadelphia. Product, cast steel and agricultural steel. *See Rolling Mills.*
- Pennsylvania Steel Works, Baldwin Station, near Harrisburg. Office, 216 South Fourth street, Philadelphia. Product, open-hearth and Bessemer steel. *See Rolling Mills.*
- Philadelphia Steel Works, William Baldwin, Frankford, P. O., Philadelphia. Built in 1865; 4 heating furnaces, 6 steam drop hammers and one tilt hammer, one cementing furnace, not now in use, and 32 steel

melting holes; product, cast and shear steel, frog steel, railroad and locomotive forgings, sledges, hammers, tools, etc. Annual capacity, 1,200 net tons.

Pittsburgh Steel Casting Co., Pittsburgh. Built in 1871; 19 steel-melting holes, one 24-pot Siemens furnace, and one Siemens open-hearth furnace of 6 tons daily capacity; product, steel castings. James Irwin, President, and Henry W. Patterson, Treasurer.

Pittsburgh Steel Works, Anderson & Woods, Pittsburgh. Owned exclusively by Robert J. Anderson. Built in 1845; 4 Siemens pot furnaces; 3 sets of coke-hole furnaces, 6 converting furnaces (weekly capacity, 90 net tons), 3 puddling furnaces, 25 heating furnaces, 16 hammers, rake-tooth shop, and 10 trains of rolls (two 20-inch plate, one 16-inch bar, one "universal" train, one 16-inch spring, two 16-inch sheet, and one 8, one 9, and one 10-inch guide); another 20-inch plate train is in course of erection; product, cast and German plow steel, plate steel, and best edge-tool steel; annual capacity, 7,000 net tons.

Pitt Steel Works, C. E. Jones & Co., Pittsburgh. Works at McKeesport, Allegheny county. Established in 1875; one 24-pot Siemens furnace, 7 heating furnaces, 2 knobbling furnaces, and 4 hammers; product, tool steel and hammered iron of all kinds; annual capacity, 1,400 net tons steel, and 1,500 tons charcoal blooms and hammered bar iron. *See Bloomaries.*

Sheffield Steel Works, Singer, Nimick & Co., Pittsburgh. Built in 1848. In mill, 6 puddling and 6 knobbling furnaces, one 18-inch train of rolls, and one $4\frac{1}{2}$ -ton steam hammer, four 24-pot Siemens gas furnaces, 30 melting furnaces, and one 5-ton open-hearth furnace; annual capacity, 12,000 net tons of cast steel. In steel-converting department, 8 furnaces; annual capacity, 5,500 net tons. In finishing mill, one 22-inch, 3-high sheet and plate train, one 16-inch, and one 10-inch bar train, 11 heating furnaces, and 10 hammers; the new plate mill has 4 sets of 28-inch rolls, 4 sets of 20-inch rolls, and 6 heating furnaces. Product, steel plates, tool steel, saw steel, and all other kinds of steel, carriage springs, and axles.

Standard Steel Works, 218 South Fourth street, Philadelphia. Works at Logan, near Lewistown, Mifflin county. Built in 1869; 28 4-pot melting holes, 5 heating furnaces, 2 hammers, 1 tire mill, and 4 boring mills; product, crucible cast steel locomotive and car tires, car and carriage axles, forgings, castings, etc. Wm. Burnham, Agent, Philadelphia.

Wayne Iron and Steel Works, Brown & Co., Pittsburgh. Product, cast steel. *See Rolling Mills.*

Number of steel works in Pennsylvania: 24.

MARYLAND.

Cumberland Steel Works, Cumberland Cast Steel Manufacturing Co., Cumberland, Alleghany county. Built in 1873-4; 5 heating furnaces, one Siemens melting furnace, one blistering furnace, and 4 steam hammers; product, all sizes of hammered tool and machinery steel, car axles, and steel castings; annual capacity, 800 net tons. J. W. Paxton, President.

Number of steel works in Maryland: 1.

OHIO.

American Sheet and Boiler Plate Co., Cleveland, Cuyahoga county. Product, steel from steel scrap. *See Rolling Mills.*

Burgess Steel and Iron Works, Portsmouth, Scioto county. Product, cast steel. *See Rolling Mills.*

Canton Steel Works, Bolton, Myers & Co., Canton, Stark county. Built in 1872; new firm organized in 1874; 6 heating furnaces, one 12-inch train of rolls, 3 hammers, 12 coke steel-melting holes, and 1 Siemens open-hearth furnace; product, machine, spring, tire and tool cast steel; annual capacity, 1,800 net tons.

Cleveland Rolling Mill Co., Cleveland. Product, open-hearth and Bessemer steel. *See Rolling Mills.*

Globe Rolling Mill, Globe Rolling Mill Co., Cincinnati. Product, steel from steel scrap. *See Rolling Mills.*

Ironton Rolling Mill, Iron and Steel Co., Ironton, Lawrence county. Product, puddled steel. *See Rolling Mills.*

Otis Iron and Steel Co., Cleveland. Put in operation Jan. 1, 1875; 3 Siemens heating furnaces, 2 hammers, 2 steel-melting holes, 2 Siemens open-hearth furnaces, and 3 trains of rolls (one 10, one 20, and one 31-inch); product, steel plate, bar and spring steel, and axles and forgings; annual capacity, 4,000 net tons. Charles A. Otis, President; J. K. Bole, Secretary, and E. B. Thomas, Treasurer.

Wheeling Steel Works, Martin's Ferry, Belmont county. Built in 1873-4; 2 heating furnaces, 12 steel-melting holes, and 2 hammers; product, all sizes of tool cast-steel.

Number of steel works in Ohio: 8.

KENTUCKY.

Ohio Valley Steel and Iron Works, Mitchell, Tranter & Co., Cincinnati, O. Works at Covington, Ky. Product, steel from steel scrap. *See Rolling Mills.*

Swift's Iron and Steel Works, Cincinnati, O. Works at Newport, Ky. Product, cast steel. *See Rolling Mills.*

Number of steel works in Kentucky: 2.

ILLINOIS.

Chicago Sheffield-Steel Works, 149 Fulton street, Chicago. Built in 1874-5; 2 heating furnaces, 2 hammers, and 4 steel-melting holes; product, tool and machinery steel; annual capacity, 300 net tons. Chas. H. Cram, President; George S. Smith, Secretary, and John P. Farrar, Superintendent.

Chicago Steel Works, 489 Noble street, Chicago, Cook county. C. P. Buckingham, President, and M. McDowell, Superintendent. Built in 1873; 3 heating furnaces, and 2 trains of rolls; do not use crucibles, but manipulate Bessemer steel; product, tires, plow beams, crow bars, springs, toe-calk steel, and squares and rounds; annual capacity, 1,000 net tons.

Springfield Iron Co., Springfield. Product, open-hearth steel. *See Rolling Mills.*

Number of steel works in Illinois: 3. Total number of steel works in the United States: 58. Of these, 36 make crucible cast steel, the others making puddled steel, open-hearth steel, or steel from steel scrap.

OPEN-HEARTH STEEL WORKS.

Bay State Iron Co., Boston, Mass. One Siemens open-hearth furnace.

Beaver Falls Steel Works, Abel Pedder & Co., Beaver Falls, Beaver county, Pa. Two Siemens open-hearth furnaces.

Blair Iron and Steel Co., Pittsburgh, Pa. One Siemens open-hearth furnace.

Canton Steel Works, Bolton, Myers & Co., Canton, O. One Siemens open-hearth furnace.

Cleveland Rolling Mill Co., Cleveland, O. Two Siemens open-hearth furnaces.

Midvale Steel Works, Nicetown, Philadelphia. One Siemens open-hearth furnace, and one Sellers open-hearth furnace.

Nashua Iron and Steel Co., Nashua, N. H. One Siemens open-hearth furnace.

New Jersey Steel and Iron Co., Trenton, N. J. One Martin open-hearth furnace.

Norway Iron Works, Naylor & Co., Boston, Mass. One Siemens open-hearth furnace.

Otis Iron and Steel Co., Cleveland, O. Two Siemens open-hearth furnaces.

Pennsylvania Steel Co., 216 South Fourth street, Philadelphia. Two Siemens open-hearth furnaces.

Pittsburgh Steel Casting Co., Pittsburgh, Pa. One Siemens open-hearth furnace.

Rumford Chemical Works, G. F. Wilson & Co., Providence, R. I. One Siemens open-hearth furnace.

Sheffield Steel Works, Singer, Nimick & Co., Pittsburgh, Pa. One Siemens open-hearth furnace.

Springfield Iron Co., Springfield, Ill. Two Siemens open-hearth furnaces.

Washburn Carwheel Co., Hartford, Conn. One Siemens open-hearth furnace.

Total number of open-hearth steel works: 16.

CATALAN FORGES.

[Under this title are embraced all works which make blooms or billets direct from ore.]

VERMONT.

Fairhaven Iron Works, Fairhaven, Rutland county. Built in 1796; 2 fires and 1 hammer: water-power; product, blooms.

Williams, A., East Middlebury, Addison county. One forge; 3 fires; product, charcoal blooms.

Number of forges in Vermont: 2.

NEW YORK.

LAKE CHAMPLAIN DISTRICT.

Bellmont Iron Works, Pope, Williams & Co., Chateaugay Lake P. O., Franklin county. Works at Belmont, Franklin county. Two forges, built in 1875; 12 fires; product, charcoal blooms and billets; annual capacity, 4,000 net tons.

Clintonville Forges, Peru Steel and Iron Co., 245 Pearl street, New York City. Works at Clintonville, Clinton county. Two forges, built in 1837 (one of 16 fires, and one of 2 fires); water-power; 1 wooden and 4 iron helve hammers; product, blooms; annual capacity, 5,000 net tons; average annual production, 3,000 tons. *See Rolling Mills.*

Dannemora Forge, State of New York owner, State Prison Yard, Dannemora, Clinton county. Built in 1853; 10 fires and 2 hammers; product, blooms. *See Rolling Mills.*

- Horicon Iron Co., 24 Cliff street, New York. Works at Ticonderoga, Essex county. One forge, built in 1864-5; 6 fires; 2 hammers; water-power; product, blooms. Cyrus Butler, President; A. W. Kellogg, Treasurer, and Wm. Hooper, Superintendent. *See Paradox Iron Works.*
- Irondale Iron Works, Penfield, Harwood & Co., Crown Point, Essex county. Built in 1828; 4 fires; 2 hammers; water-power; product, blooms.
- Irondale Iron Works, A. Williams, Irondale, Clinton county. One forge; 4 fires.
- Jefferson Iron Co., Antwerp, Jefferson county. One forge; 4 fires. *See Charcoal Furnaces.*
- Kingdom Forge, Essex and Lake Champlain Ore and Iron Co., Elizabethtown, Essex county. Built in 1825; 6 fires; 1 hammer; water-power; product, blooms.
- Lewis Iron Works, William H. Stower, Lewis, Essex county. One forge, built in 1837; 4 fires; 1 hammer; water-power; product, blooms.
- New Russia Iron Works, H. A. Putnam, Elizabethtown, Essex county. One forge; 4 fires. Forge at New Russia, 4 miles south of Elizabethtown.
- Norton, C. F., Plattsburgh, Clinton county. One forge; 6 fires.
- Palmer, Williams & Co., Altona, Clinton county. Built in 1868; one forge; 5 fires; product, charcoal blooms and billets; water-power; annual capacity, 2,000 net tons. Use Arnold Hill and Port Henry ore.
- Paradox Iron Works, Horicon Iron Co., 24 Cliff st., New York. Works at Schroon River, Essex county. Built in 1864; 3 fires and 1 hammer; water-power; product, blooms; annual capacity, 900 net tons.
- Payne's Forge, D. F. Payne, Wadham's Mills, Essex county. Built in 1873; 3 fires and 1 hammer; water-power; product, blooms for best boiler plate; annual capacity, 1,000 net tons.
- Reynolds, (Asa), Irona, Clinton county. One forge; 4 fires.
- Riverside Iron Works, James N. Stower, Willsborough, Essex county. One forge; built in 1835, and rebuilt in 1863; 5 fires; water-power.
- Rogers (J. & J.) Iron Co., (1.) Au Sable Forks, Essex county, (2.) Blackbrook, Clinton county, and (3.) Jay, Essex county. (1.) One forge, built in 1848; 4 fires. (2.) 2 forges, built in 1832; 12 fires. (3.) One forge, built in 1809; 6 fires. Product, blooms. All run by water-power. Total annual capacity, 8,000 net tons. *See Rolling Mills.*
- Schroon River Iron Works, John Roth, Schroon River, Essex county. One forge, built in 1857; 4 fires; water-power; product, blooms.
- Stackpole, S., Dannemora, Clinton county. One forge; built in 1874; 2 fires; product, blooms.
- Star Iron Works, Bowen & Signor, Saranac, Clinton county. Two forges,

built in 1844; 10 fires; water-power; product, steel billets, wire billets, and blooms for boiler plate and flue iron; annual capacity, 3,600 net tons bloom iron; average make, 3,000 tons.

Stone Forge, Nichols, Hull & Co., Plattsburgh, Clinton county. Built in 1840; 4 fires and one hammer; water-power; product, blooms.

Williams, A., Clayburgh, Clinton county. One forge, built in 1844; 5 fires.

Williams & Moffitt, Saranac, Clinton county. One forge; 5 fires.

Wilmington Forge, W. F. & S. H. Weston, Wilmington, Essex county.

Rebuilt in 1874; one forge; 4 fires; water-power; product, blooms.

Wood Brothers, Wood's Falls, Clinton county. One forge, built in 1863; 5 fires; water-power; product, blooms.

Number of forges in New York: 27.

ABANDONED.

John Merchant's Forge, Schuyler Falls, Clinton county. One forge, built in 1844; 2 fires; 1 hammer; water-power; product, blooms.

NEW JERSEY.

Wilson Iron Co., Dover, Morris county. Forge built in 1874-5; 4 forge fires; product, blooms from ore. Office, 90 John street, New York.

Number of forges in New Jersey: 1.

NORTH CAROLINA.

Cranberry Forge, Mitchell county.

Fain's Forge and Owl Creek Forge, Meser Fain, Murphy, Cherokee county. Built in 1852.

Henson's Forge, Johnston & Co., Murphy. Wm. Beal, Agent. Built in 1853.

Rocky Point Forge, Patton & Olmstead, Murphy. Built in 1852.

Tomotla Forge, Cherokee county. Built in 1860. Joseph Kinsey, President, Cincinnati, O., A. A. Campbell, Superintendent, Ducktown, Polk county, Tennessee.

Walker's Forge, Mrs. Walker, Murphy. Built in 1852.

Number of forges in North Carolina: 7.

TENNESSEE.

Hampton Forge, Hampton, Carter county. Two fires.

Taylor Iron Works, Elizabethtown, Carter county. Three fires.

There are a number of small forges in Carter county, which make bar iron in insignificant quantities.

Number of forges in Tennessee: 2. Total number of forges in the United States: 39.

BLOOMARIES.

[Under this title are embraced all works which hammer blooms from pig or scrap iron.]

MASSACHUSETTS.

Mount Hope Iron Works, Somerset, Bristol county. Built in 1857; 2 forge fires and one hammer; water-power; product, charcoal blooms. *See Rolling Mills.*

Number of bloomaries in Massachusetts: 1.

NEW JERSEY.

Cliffwood Forge, T. H. Hoagland, Rockaway, Morris county. Built about 1800; 2 fires and 1 hammer; water-power. Also, Rockaway Forge, and Shipping Port Forge. Product, wrought scrap blooms. Total annual capacity, 1,500 net tons.

Warren Steam Forge, McClees & Co., Phillipsburg, Warren county. Built in 1875; 1 refinery, 3 forge fires, and 1 steam hammer; product, charcoal blooms for sheet iron; annual capacity, 800 net tons. Office, 51 Little Twelfth street, New York. *See Rolling Mills.*

Number of bloomaries in New Jersey: 4.

PENNSYLVANIA.

Barre Forge, Estate of A. L. Mumper, Barre Forge, Huntingdon county. Four forge fires; product, charcoal blooms; annual capacity, 900 net tons. *See Charcoal Furnaces.*

Carlisle Iron Works, C. W. & D. V. Ahl, Boiling Springs, Cumberland county. Built in 1791; 5 forge fires and 1 hammer; water-power; product, charcoal blooms; annual capacity, 2,400 net tons; average make, 2,200 tons. *See Charcoal Furnaces.*

Castle Fin Forge, Assignee of J. M. Bowman, Castle Fin, York county. Four fires and 1 run-out; 2 hammers; water-power; product, charcoal blooms; annual capacity, 1,000 net tons; average yearly make, 750 tons.

Charming Forge, W. & B. F. Taylor, Womelsdorf, Berks county. Works very old; 5 fires, 1 heating furnace, 1 refinery, and 2 hammers; product, blooms and hammered bar iron; annual capacity, 1,000 net tons; average make, 700 tons.

Cold Spring Forge, S. H. Hicks & Brothers, Tyrone, Blair county. Product, blooms.

Colemanville Forge, Edmund Smith, Colemanville, Lancaster county. Built in 1828; water-power; annual capacity, 500 net tons blooms.

Coleraine Forge, Shorb, Stewart & Co., Coleraine, Huntingdon county.

Cove Forge, John Royer, Royer P. O., Blair county. Two forge fires and one run-out. Product, charcoal blooms; annual capacity, 450 net tons. *See Charcoal Furnaces.*

Cove Forge, Wm. McIlvain & Sons, Duncannon, Perry county. Built in 1864; 5 fires, one refinery and one hammer; blast operated by water-power, and hammer by steam; product, charcoal blooms; annual capacity, 1,200 net tons; average yearly make, 900 tons. *See Eastern Pennsylvania Rolling Mills.*

Eagle Forge, C. Curtin & Co., Roland, Centre county. Built in 1809; 8 fires and 1 hammer; water-power; product, boiler slabs and round blooms; annual capacity, 1,500 net tons. *See Charcoal Furnaces. See Central Pennsylvania Rolling Mills.*

Ellendale Forge, Spang & Wannier, Ellendale Forge, Dauphin county. Rebuilt in 1872; 5 fires, 1 run-out for coke, and 1 hammer; water-power; product, anthracite and charcoal blooms; annual capacity, 1,200 net tons; average make, 950 tons. *See Monroe Forge.*

Ellwood Forge, J. B. Seidel & Sons, Ellwood, Schuylkill county. Built in 1863 by Dr. Geo. N. Eckert, and bought in April, 1874, by present owners; 4 fires and 1 run-out; product, charcoal blooms; annual capacity, 1,250 net tons. *See Perry Forge.*

Etna Forge, Geo. D. Isett & Bro., Yellow Springs, Blair county. Four forge fires; product, charcoal blooms. *See Charcoal Furnaces.*

Exeter Forge, Morgan J. Althouse, Jacksonwald, Berks county. Product, blooms.

Franklin and Sarah Forges, Assignees of Essington Hammond, Sarah P. O., Blair county. Four forge fires; product, charcoal blooms; annual capacity, 900 net tons. *See Charcoal Furnaces.*

French Creek Iron Works, B. F. Morret, Pottstown, Montgomery county. Built in 1872; product, charcoal, anthracite and scrap blooms.

Juniata Forge, J. R. Hunter & Co., Petersburg, Huntingdon county. Four forge fires and 1 hammer; water-power; product, charcoal blooms; annual capacity, 800 net tons.

Juniata Iron Works, S. & B. R. Hatfield, Alexandria, Huntingdon county. Built in 1837; 4 fires and one 4-tuyere run-out, and a puddling forge, with 3 single puddling furnaces; water-power; product, charcoal blooms, made into boiler plate at the Brandywine Rolling Mills, Coatesville, Pa.; annual capacity, 950 net tons of blooms, and 750 net tons of puddled blooms; average annual make, 850 tons of blooms, and 750 tons of puddled blooms. *See Eastern Pennsylvania Rolling Mills.*

Knauerstown, Chester county. One forge.

Liberty Forge, Mumma & Boyer, Lisburn, Cumberland county. Product, blooms.

- Logan Forge, Valentine & Co., Bellefonte, Centre county. Product, blooms. *See Charcoal Furnaces. See Central Pennsylvania Rolling Mills.*
- Logan Works, Logan Iron & Steel Co., Lewistown, Mifflin county. Office, 218 South Fourth street, Philadelphia. Forge built about 1810; 4 charcoal fires, 1 run-out for coke, and 2 hammers; steam and water-power; product, charcoal blooms. *See Charcoal Furnaces. See Central Pennsylvania Rolling Mills.*
- Mainville Forge, C. E. Pennock & Co., Mainville, Columbia county. Built in 1824; 1 hammer, 3 forge fires, and 1 run-out; water-power; product, charcoal blooms; annual capacity, 800 net tons. *See Eastern Pennsylvania Rolling Mills.*
- Martic Forge, Potts & Davis, Colemanville, Lancaster county. Four fires; water-power; product, charcoal blooms; annual capacity, 1,000 net tons; average annual make, 600 tons.
- Mary Ann Forge, Downingtown, Chester county. Built in 1806; 3 fires and 1 hammer; water-power; product, blooms; annual capacity, 720 net tons.
- Milesburg Iron Works, McCoy & Linn, Milesburg, Centre county. Built in 1800; product, blooms. *See Charcoal Furnaces. See Central Pennsylvania Rolling Mills.*
- Monroe Forge, Spang & Wanner, Union Forge P. O., Lebanon county. Four fires and 1 run-out; water-power; product, anthracite and charcoal blooms; annual capacity, 850 net tons; average make, 650 tons. *See Ellendale Forge.*
- Mont Alto Iron Works, Mont Alto Iron Co., G. B. Wiestling, Superintendent, Mont Alto, Franklin county. 7 fires, and a double run-out; Nasmyth steam hammer; product, charcoal blooms and wire billets; annual capacity, 2,000 net tons. I. S. Waterman, President, 407 Library st., Phila. *See Charcoal Furnaces.*
- Mount Airy Forge, Thomas E. Williams, Shartlesville, Berks county. Built about 1840; water-power; product, blooms.
- New Market Forge, Light Brothers, Palmyra, Lebanon county. Product, blooms.
- North Kiln Forge, Shartlesville, Berks county. Product, blooms. Idle for several years.
- Perry Forge, J. B. Seidel & Sons, Marysville, Perry county. Built in 1862; 5 fires, and 1 run-out; water-power; product, charcoal blooms; annual capacity, 1,500 net tons; average make, 1,150 tons. *See Ellwood Forge.*
- Pitt Steel Works, C. E. Jones & Co., Pittsburgh. *See Steel Works.*
- Ringwood Forge, Thomas J. Bailey, Penningtonville, Chester county.

Very old works; 3 forge fires and 1 run-out; water-power; product, charcoal blooms.

Sadsbury Forge, Charles Goodman & Brother, Penningtonville, Chester county. Works very old; 3 forge fires and 1 run-out; water-power; product, charcoal blooms.

Springton Forge, Cornog & McIlvaine, Wallace, Chester county. Very old works; 4 forge fires and 1 run-out; water-power; product, charcoal blooms.

Tyrone Forges, Lyon, Shorb & Co., Tyrone, Blair county. Built in 1867; 12 forge fires and 1 Scotch hammer; steam and water power; product, charcoal blooms. *See Charcoal Furnaces.*

Union Forge, Spang & Bland, Union Forge, Lebanon county. Very old works; product, blooms; annual capacity, 1,000 net tons; average make, 700 tons.

Washington Forge, Jacob Yearick, lessee, Lamar, Clinton county. Product, blooms. *See Charcoal Furnaces.*

Number of bloomaries in Pennsylvania: 39.

MARYLAND.

McCullough Iron Co., Northeast, Cecil county. Office, Sixteenth street and Washington avenue, Philadelphia. Built in 1847; 8 fires; steam and water-power; annual capacity, 3,000 tons blooms for making galvanized sheet iron. *See Rolling Mills in Maryland and Delaware.*

Number of bloomaries in Maryland: 1.

VIRGINIA.

Crockett, Sanders & Co., Wytheville, Wythe county. Built in 1863; 2 fires; product, charcoal blooms; annual capacity, 250 net tons. *See Charcoal Furnaces.*

Grey Eagle Forge, David Huddle, Brown Hill, Wythe county. Built in 1862; 2 fires; product, charcoal blooms; annual capacity, 250 net tons. *See Charcoal Furnaces.*

Mount Vernon Iron Works, Wyeth Iron & Steel Co., Weyer's Cave, Rockingham county. Built in 1848; 8 fires and 2 hammers; water-power; product, blooms. *See Charcoal Furnaces.*

Pine Forge, James Leonard, Mount Jackson, Shenandoah county. Rebuilt in 1874; 1 forge fire, 2 hammers, 1 refinery, and 3 knobbling fires; water-power; product, blooms and bar iron; annual capacity, 500 net tons.

Porter's Forge, Stephen Porter, Porter's Forge, Wythe county. Built in 1865; 2 fires; product, charcoal blooms; annual capacity, 250 net tons.

Reed Island Forge, Forney & Co., Allisonia, Pulaski county. Built in

1875; water-power; 2 fires, but are prepared to increase the number to 5 or 6 as soon as trade improves; ore used is brown hematite. D. S. Forney, Manager.

Shenandoah Iron Works, Wm. Milnes, Jr., Shenandoah Iron Works, Page county. One forge, 6 fires, and 1 run-out with 6 tuyeres; product, charcoal blooms; annual capacity, 1,800 net tons. *See Charcoal Furnaces.*

Number of bloomaries in Virginia : 7.

NORTH CAROLINA.

Madison Forge, Jonas W. Derr, Lincolnton, Lincoln county. One forge; 2 fires; product, bars and plow molds; water-power; annual capacity, 100 net tons. *See Charcoal Furnaces.*

Rehoboth Forge, Leonard & Benedict, Iron Station, Lincoln county. Product, charcoal blooms; yearly capacity, 400 net tons. *See Charcoal Furnaces.*

Number of bloomaries in North Carolina : 2.

WEST VIRGINIA.

Capon Iron Works, Keller & Co., Capon Iron Works, Hardy county.

Built in 1874; 4 fires; product, charcoal blooms. *See Charcoal Furnaces.*

Number of bloomaries in West Virginia : 1.

TENNESSEE.

Randolph Forge, Woods, Yeatman & Co., Cumberland Iron Works, Dickson county. Forge in Stewart county. Built in 1853; product, charcoal blooms; not in operation for 5 years. *See Charcoal Furnaces.*

Number of bloomaries in Tennessee : 1.

MISSOURI.

Dozier, Maharg & Co., Kimmswick, Jefferson county. Built in 1873; 5 knobbling fires and 1 hammer; product, charcoal blooms; annual capacity, 1,200 net tons.

Germania Iron Works, Zeitinger & Zoppi, Carondelet, St. Louis county. Built in 1871; 6 knobbling fires and 2 steam hammers; product, blooms and billets; annual capacity, 1,500 net tons blooms, and 400 net tons billets for wire works.

Maramec Iron Works, William James, Maramec Iron Works, Phelps county. 8 forge fires; water-power; product, charcoal blooms. *See Charcoal Furnaces.*

Number of bloomaries in Missouri : 3. Total number of bloomaries in the United States : 59.

N O T E.

Since the foregoing pages were printed we have received the following description of a rolling mill in Indiana :

Aurora Iron and Nail Co., Aurora, Dearborn county, Indiana. Built in 1874 ; 5 single puddling furnaces, 5 heating furnaces, 3 trains of rolls, 8 nail machines and 2 hammers ; also 3 nut machines and 3 nut furnaces ; additional puddling and heating furnaces and nail machines and another train of rolls are being built ; product, hoops, sheets, plates, bars, angles, nails, and hot-pressed nuts. O. P. Cobb, President ; L. C. Goodale, Vice-President ; H. S. Campbell, Secretary, and L. M. Foulke,

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